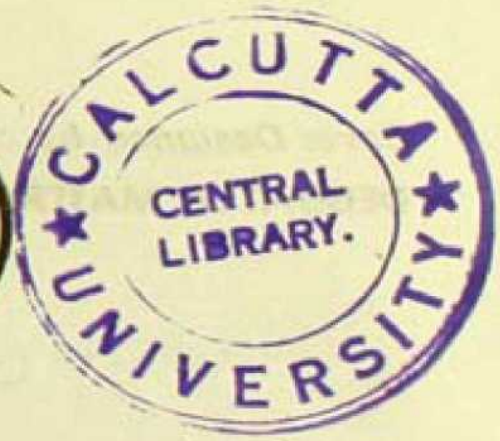
MEDICAL SCIENCE IN ANCIENT INDIA

Edited by

JUTHIKA MAITRA



CENTRE OF ADVANCED STUDY IN
ANCIENT INDIAN HISTORY & CULTURE
UNIVERSITY OF CALCUTTA
1995

Published by :
CENTRE OF ADVANCED STUDY
Department of Ancient Indian History & Culture
University of Calcutta
51/2 Hazra Road
Calcutta-700 019

Printed by :
S. B. ART PRINTERS
18/C Raj Chandra Sen Lane
Calcutta-700 009

Cover Designed by :
DEBDATTA MAITRA

PRICE : RUPEES 100·00 ONLY

CONTENTS

PREFACE

The historical importance of the Indian Science of Health and its contributions to the world of medicine are now well recognised But unfortunately the history of the Ayurveda does not find its rightful place in the curricula of History in Indian Universities. As a result the students and often teachers are oblivious of an important aspect of Indian material culture.

The Centre of Advanced Study, Department of Ancient Indian History and Culture, University of Calcutta, organised a three-day inter University Seminar on 'Medical Science in Ancient India' on the 22nd to 24th March, 1995. The objective of the seminar was to compare the Ayurveda with other early medical sciences and to evaluate its relevance to the modern science of medicine. In short we intended to assess the historical importance of the indigenous medical science in proper perspective. Eminent historians, researchers and medical practitioners participated in the deliberations of the seminar and made the seminar a forum for exchange of ideas between the traditionalists and the modernists.

The papers presented in the seminar are included in this volume. The written version of Dr. A. Roychoudhury's lecture was not available, so we are printing his paper "Cranial surgery in ancient India Trepanation of Skull" from our journal (Journal of Ancient History, Vol. XII 1978-1979). It may be noted that Dr. Roychoudhury's article published here deals partially with his paper discussed at the seminar.

There are a number of misprints though easily intelligible, I beg to be excused by the readers for this lapse on my part.

I take this opportunity to express my sincere thanks Prof. Rathindra Narayan Basu, Vice-Chancellor, University of Calcutta and Prof. Prabuddha Nath Ray, Pro-Vice-Chancellor of Academic and Business Affairs, for giving us moral and financial supports. Thanks are due to Prof. Bratindranath Mukherjee, Carmichael Professor, Department of Ancient Indian History and Culture, whose encouragement, kind help and co operation enabled me to bring out this volume.

My sincere thanks are due to Sri Madan Chatterjee whose constant help and support always enthuses me. Thanks are also due to Sri Tapas Basu of S. B. Art Printers for the care he has taken in printing this volume. Ghiyasuddin Mallik and Swapna Chakraborty helped me in co-ordinating and typing, and both of them amply deserve my thanks.

JUTHIKA MAITRA
Head of the Department
Dept. of Ancient Indian History & Culture
University of Calcutta

Dated
20.4.96

Medical Science in Ancient India

P. V. Sharma, Varanasi

Medical science in India is known as 'Āyurveda' (Science of Life) which deals life as whole. In fact, it is a way of living by which man can attain and maintain optimum health and thereby the goal of highest perfection. Thus Āyurveda is not restricted to a system of medicine like other systems prevalent in the world but only incorporates that in the sense that it paves the way to prevent disorders and cure them, if they occur, so that one can enjoy perfect health and happiness in order to discharge his personal duties and to fulfil social obligations. Life should not be only 'sukhī' but also 'hita' (useful to society) as has been defined by Caraka.[1]

Four-dimensional approach.

World Health Organization has rightly recognised the three aspects, physical, mental and social well-beingin defining health but still is deficient in spiritual aspect. Health, in Āyurveda, is four-dimensional rather than three-dimensional as defined by Suśruta.[2] This is in tune with the Indian culture which prescribes four aims of human life-dharma (virtue), artha (wealth), kāma (enjoyments) and mokṣa (liberation). Āyurveda, keeping this in view, suggests ways to achieve all of them so that man may rise from imperfection to perfection, ignorance to knowledge, darkness to light and from mortality to immortality. The last one is related to mokṣa where all sufferings cease[3] and which is the final goal that is why Āyurveda is said as the best one among those providing immortality.[4]

Āyurveda an upaveda ?

Āyurveda being an upaveda is an integral part of the Indian culture. Though it is difficult to decide as to which veda Āyurveda is related as upaveda, Caraka says that we should have allegiance to the Atharvaveda as it deals mostly with the treatment of disorders.[5] Suśruta mentions Āyurveda as 'upāṅga' (subsidiary part) of Atharvaveda which was revealed by the Creator (Brahmā) even before creatures were born.[6] It indicates the beginningless (anādi) stream of medical knowledge which has been flowing incessantly and eternally (śāśvata) transcending the limits of time and space. Caraka says that the origin of 'Ayurveda can not be traced but only in terms of revelation and deliverance.[7]

Divine Tradition

In texts, the divine tradition of Āyurveda has been traced from the Creator (Brahmā) down to Bharadvāja or Dhanvantari in the following successive stages :

1. Brahmā
2. Daksa Prajāpati
3. Aśvins
4. Indra
5. Bharadvāja or Dhanvantari
6. Ātreya[8] or Suśruta[9]

These six stages may distinctly be divided into three periods—pre-vedic, (1-2), vedic (3-4) and post -vedic (5-6).[10]

Pre-vedic Age

As soon as the man descended on earth he took care for preservation of his body and mind and for this he employed

all available resources of Nature—plants, animals and inorganic substances which were utilised as diet and drugs. In Indus Valley Civilization, the use thereof is proved by the remains found in excavations at Mohenjo-daro and Harappa. Perhaps trephining of skull was also performed as is evident from the holed skulls found in excavations.[11]

Vedic Age

During vedic period, we find great and miraculous feats of the divine twin-physicians, Aśvins[12] which are interwoven in the entire Rgveda. They are the prototype of an ideal physician-surgeon who are observed ever-moving in the services of not only gods but also of human beings for which they had to face the wrath of gods who boycotted them for partaking in the sacrifices. It was again due to professional miracle on the sage Cyavana that they attained their due position among gods.

The twin character of Aśvins symbolises the undivided specialities of medicine and surgery which were in the process of evolution. The other speeialities too were not quite distinct and the vedic physician (Bhiśak) treated all sorts of cases with magical charms and mechanical intervention wherever necessary. He was at once 'rakşohā' (killer of of demons) and 'amībacātana (destroyer of diseases) which functions he performed with the knowledge of potent herbs (Oşadhis)[13].

The vedic term 'bhişak' denotes the traditional physician while 'Vaidya' of later period was well versed in both tradition and scriptures which were developed in course of time.

The Oşadhi-śukta (Rgveda 10.97. 1-23) is the first

documentary evidence of the study of plants botanically and also pharmacologically. In Atharvaveda, a large number of medicinal plants are found in treatment of disorders. The anatomical parts of the body are enumerated and disease-syndromes were also specified. This is a distinct development of medical materials and techniques with approach to maintenace of health and cure of disorders. Kauśikasūtra (4. 16.) mentions mechanical intervention in case of urinary obstruction.

Āyurveda vis-a-vis vedas

It appears that Āyurveda has been serving from time immemorial as folk-lore which was reflected in the parallel stream of culture-lore represented by vedas and later classical literature. Thus perhaps it is misnomer to label Āyurveda as upaveda whlch can utmost indicate its affinity or similarity with a certain veda as Caraka has pointed out. Perhaps this is the reason that Āyurveda could not be tagged to either Ṛgveda or Atharvaveda decidedly.

Post-vedic Contributions

Though some hints about the basic concepts like Tridoṣa etc. are found here and there in vedas they were not systematised during that period. This was done during the post-vedic period but the back-ground was prepared probably in the age of upaniṣads when intellectual ferment was visible in every field and various theories were propounded about creation and workings of human nature. A clear concept of digestion and metabolism is found in the Chhāndogya upaniṣad where it is mentioned that the food taken is divided into three portions—the gross portion is

excreted as stool, the middle one is transformed into māṁsa (dhātu) while the subtle one nourises mind.[14] Similarly cardiac cycle has been beautifully depicted in interpreting the term 'Hṛdaya' as 'Hṛ' to receive, 'Da' to supply and 'Ya' to move.[15] The concept of Agni and Soma was further developed by adding Pṛthivi (Anna) into Trivṛtkaraṇa which is amply described in the above upaniṣad. The colours red, white and black symbolising the three principles of Tejas, Ap and Anna[16] respectively remind us of the three doṣas-pitta, Kapha and Vāta which have the similar colours. Thus it is evident that the basic concepts of Āyurveda were formulated during the period of upaniṣads and were crystallized and documented in the great saṃhitās of Āyurveda.

Specialization in Āyurveda

It is in the early saṃhitās that we find the well established scientific foundation of Āyurveda. It is also during this period that specialities were distinctly divided into eight and as such thenceforth Āyurveda came to be known as 'Aṣṭāṅga' (having eight parts) which was popularised later by Vāgbhaṭa who entitled his work as 'Aṣṭāṅgahṛdaya. These aṅgas are as follows ;

1. Kāyacikitsā (General Medicine)
2. Śalya (Surgery)
3. Śālākya (Dealing with supra-clavicular diseases)
4. Kaumārabhṛtya (Paediatrics including obstetrics and Gynaecology).
5. Agadatantra (Toxicology)
6. Bhūtavidyā (Dealing with invisible agents and mental disorders)

7. Rasāyana (Promotive therapy)

8. Vājikaraṇa (dealing with aphrodisiacs)[17]

These aṅgas were broadly categorised into two schools one of Medicine and the other of Surgery.

Schools of Medicine and Surgery

In school of medicine, Punarvasu Ātreya was the supreme teacher who had six disciples namely Agniveśa, Bhela, Jatūkarna, Parāśara, Hārīta and Kṣārapāṇi. They all composed their own treatises compiling the teachings and discussions of Ātreya among which the treatise of Agniveśa (Agniveśa-tantra) was the first and the topmost.[18] The Agniveśatantra was further annotated and refined by Caraka and came to be renowned as the Carakasaṃītā which was later redacted by Dṛḍhabala during the Gupta period. Thus what is known as the Carakasaṃitā at present is originally the Agniveśatantra developed and transformed through the above successive stages. Carakasaṃhitā is the representative text of the school of medicine.

Similarly, Kāśirāja Divodāsa Dhanwantari is the founder-teacher of the school of surgery. He had, amoug his disciples, Suśruta the most brilliant one who composed the Suśrutasaṃhitā[19], the representative compendium of this school.

On the other specialities also a number of treatises were composed. For instance, the treatises of Nimi, Videha, Karāla, Sātyaki etc. on Ophthalmology were quite popular and as such quoted as authorities by commentators. In the area of paediatrics, the works of Parvataka, Bandhaka, Jīvaka etc. are mentioned.[20]

Beginning of medical relief centres

Thus a huge literature was produced on different specialities which became almost impossible for an individual to be well versed therein. Since the time of Aśoka a chain of hospitals and dispensaries were established all over the country which necessitated preparation of handbooks on medicine containing essentials of all specialities in order to enable the general physician to cater to the medical needs of the people at large. This demand was fulfilled by the age of compilation which began in Pre-Gupta period and produced works like Nāvanītaka (Cream of knowledge) and Aṣṭāṅgahṛdaya (Essence of eight aṅgas). Vṛnda (10th cent. A. D.) mentions that Nāgārjuna got his formulation on eye disease inscribed on a pillar at Pāṭaliputra.[21]

Rational Medicine and Basic concepts

In the period of Āyurvedic saṁhitās, the scientific approach gained over the magical charms of the vedic period which are known as yuktivyapāśraya (rational medicine) and Daivavyapāśraya[22] (godly medicine) respectively. Caraka, in every dealing, emphasises on rationale (yukti) so much so that he stands as the single philosopher establishing yukti as one of the pramāṇas (means of valid knowledge). Establishment of the theories of Pañcabhūta, and Tridoṣa and of the pharmacological concepts of Rasa, Guṇa, Vīrya, Vipāka and Prabhāva made, spectacular and radical change in outlook and provided key to understand and interpret logically the biological phenomana and effects of drugs and diet. The concepts of Agni and Srotas solved the riddle of digestion and metabolism which provide basis for nutritional status. The concept of Prakṛti (Human Constitution) is

unique contribution of Ayurveda which provides every person a distinct individuality which govern and guides his nature and activities. According to Gītā, it is 'Svabhāva' which guides 'Svadharma' of the person. All the branches like Physiology, Pathology, Medicine and Pharmacology are linked together harmoniously with these scientific concepts. Visualisation of uniformity in person and Nature (Loka-Puruṣa-Sāmya)[23] led not only to spiritual realisation but also application of physical laws to the biological field.

Materia Medica and Pharmacy were also developed on scientific lines. Drugs and dietary substances were classified systematically in various grounds. Caraka has classified drugs from different angles such as source, effect on doṣas[24] and systemic action. He has coined fifty groups of drugs according to action, each consisting of ten model drugs[25]. Similarly, food and drinks were classified in various categories. It is surprising to note that they had clear idea of balanced diet which has been defined by the terms; 'sarvagraha' (total quantity of food) and 'parigraha (quantity of individual items)[26]. Kauṭilya calls it as 'Āryabhakta'[27] (ideal diet). In saṃhitās all the essential items of food are enumerated such as śūkadhānya (Carbohydrates); lavaṇa (salts), phala-śāka (vitamins) and jala (water).[28] From these groups described in detail one can select the articles of food and drinks according to his choice and requirement.

Dissection of dead bodies and surgical operation

Suśruta leads the school of Surgery. He is the first author who has described the method of dissection of dead

body[29] and stressed on its need and importance for adequate knowledge of Anatomy. Thus he is at once called 'Father of Anatomy' and 'Father of 'Surgery'. In Suśrutasaṃhitā one finds a number of surgical operations such as for piles, fistula, lapratomy, Caesarian section, cataract etc. including plastic surgery besides ancilliary measures of venesection, alkali therapy, cauterization etc.[30]

Paediatrics

Kāśyapasaṃhitā, is a specialised text on paediatrics which provides a sample of knowledge in that speciality during those times.

Rasāyana and Vājikarana

Emphasis has always been on prevention and such two aṅgas - Rasāyana and Vāj karana—were devoted to this so that the person could maintain optimum health and immunity to fight against diseases.[31] Rasāyana deals with general promotive measures while vājikarana prescribes aphrodisiacs so that one could have good reproductive potency and might not suffer from deficiency diseases in this respect.

Development in later phase

During the later phase of the ancient period the following developments took place which are important historically—

1. Texts were composed on Nidāna (Diagnosis) exclusively such as Rogaviniścaya or Mādhavanidāna.

2. A number of Nighaṇṭus (texts on materia medica) were composed such as Paryāyaratnamālā, Aṣṭāṅganighaṇṭu, Dhanvantarinighaṇṭu etc.

3. Pharmaceutics also gained momentum and as such texts containing formulations, classified according to pharmaceutical forms, were composed. Notable among them are the works of Candraṭa (Yogaratnasamuccaya), Śārṅgadhara (Śārṅgadharasaṃhitā) and Soḍhala (Gadanigraha).

4. A new speciality came up Rasaśāstra dealing with mercurials and their processings. Rasārṇava in Rasahṛdayatantra are the earlier works.

5. Commentaries on the saṃhitās were written by scholars like Jejjaṭa, Cakrapāṇidatta, Ḍalhṇa etc.

6. Following the order of diseases proposed by Mādhava texts on medicine were compiled by authors like Vṛnda (Siddhayoga), Cakrapāṇidatta (Cakradatta or Cikitsāsaṅgraha).

Contributions of Buddhist missionaries

Discussion on medical science in ancient India would be incomplete if the contributions of Buddhist vihāras and wandering missionaries thereto is not mentioned. These vihāras served, apart from being religious shrines, as medical relief to the suffering humanity. The Buddhist texts like cullavagga throw imense light on the status of medical relief through these centres. Buddhist missionaries, on the other hand, carried Āyurveda far and wide in countries such as Śrilanka, South and South-east Asia, Central Asia etc. and thus made significant contribution in propagation of Āyurveda which they called 'tikiccha'.

Influence of Āyurveda outside India

It is a known fact that trade relations of India existed with ancient civilizations of Assyria, Babylonia and Egypt.

Greeks also came in contact with India in early times and borrowed many things ftom Āyurveda. One is surprised to find striking similarity in the thoughts and approach of Caraka and Hippocrates, the Father of modern medicine. Arabs were highly influenced by the professional skill and academic excellence of Indian Vaidyas and during the times of Harun-al-Rashid (8th cent. A. D.) physicians and scholars were invited to work there in hospitals and Libraries. The latter took up the work of translating Ayurvedic texts in Arabic and in this series a number of important texts like saṃhitās of Caraka, Suśruta and Vāgbhaṭa and Mādhavanidāna had Arabic translation.[33]

Health and Disease

Equilibrium is a synonym of normalcy in Indian culture. In Āyurveda too, equilibrium is health and disequilibrium is disease.[33] Person, in the state of equilibrium, is called 'Svastha' (one who stays in self). In Gītā, this state is termed as 'Yoga'.[34] To preserve health, equilibrium has to be maintained by observing properly the rules of Dinacaryā (daily routine), and Ṛtucaryā (seasonal regimen) while in case of disease equilibrium has to be restored by application of suitable diet, drugs and behaviour. The peculiar feature of Āyurvedic management of disorders is Saṃśodhana cikitsā (evacuative therapy) prior to administering pacifying remedies (Saṃśamana cikitsā). The former consists of pañcakarma (five measures) preceded by snehana (unction) and svedana (sudation). Treated in this rational way the diseases are eradicated and do not recur.[35]

Conclusion

Mecical science in ancient India known as Āyurveda was highly developed and with a dynamic approach adjusted to the needs of changing times by evolving new specialities and techniques. Starting from pre-vedic to post-vedic period it acquired a rational and scientific background basing interpretation of biological phenomena on sound fundamental concepts thus superceding the magical charms of the earlier age. The secret of the eternality of Āyurveda is the unique blending of philosophy and science and its intimate relation with Indian life and culture. It is only recently that the modern medical profession has begun realising the value of life-style in management of problem diseases. Lastly, Āyurveda (medical science) in ancient India not only served the Indian people but also made significant contributions in evolution of World medicine.

References

1. CS. SU. 1.41
2. SS, SU. 15. 1
3. CS, Sa, 1.137
4. Ibid. SU 1 40
5. Ibid. SU.30:21
6. SS, SU. 1.6
7. CS. SU. 30. 27
8. Ibid. SU. 1.4-5
9. SS. SU. 1,20
10. Sharma P.V. (ed) : History of Medicine in India, INSA, New Delhi. 1992, Int. P. VIII
11. Op. cit. P. 6-7
12. Sharma P.V. : Asvin sand their Miracles, Nagarjuna, Dec. 64

13. Rgveda 10.97.6
14. Chhāndogya Upaniṣad 6.5.1
15. Śatapatha Brāhmaṇa 14.8.4.1
16. Chhāndogya Upaniṣad 6.4.1
17. CS. SU. 30.28
SS. SU. 1.7
18. CS. SU. 1.30-33
19. SS. SU. 1,3
20. Ḍalhaṇa's comm. on SS.U. 1.5
21. Vṛnda : Siddhayoga 61.148-52
22. CS. SU. 11.54
23. Ibid. Sa. 5.1:8
24. Ibid SU. 1.67-68
25. Ibid. SU . 4.9-18
26. Ibid. Vi. 1.21(4)
27. Kauṭilya's Arthaśāgtra 2.31.15
28. CS.SU.ch. 27 ; SS. SU, ch. 45-46
29. SS. Sa. 5. 47-49
30. Sharma P.V.op. cit., pp. 325.34
31. CS. Ci. 1.1.7-8
32. Sharma, P.V. op. cit. ch. 13
33. AH. SU. 1.20
34. Gītā 2.48
35. CS. SU. 16.20

Abbreviations

AH. Aṣṭāṅgahṛdaya
Ci. Cikitsāsthāna
CS. Caṛakasaṁhitā
Sa. Sarīrasthāna
SS. Suśrutasaṁhitā
SU. Sutrasthāna
Vi. Vimānasthāna
U. Uttaratantra

The interaction and dissemination of Knowledge

S. K. Bagchi

The cross-cultural interaction and dissemination of knowledge took place in the fields of religion, philosophy and sciences. We all are aware that in ancient times astronomy, mathematics and medicine were the three main branches of science in which interaction took place between different cultures. I shall try to discuss about the interaction and exchanges giving examples from the history of science. To prove my point I shall cite examples mainly from astronomy and mathematics, as, for medicine there is a separate session on interaction and dissemination in medicine.

The problem of scientific influence and interaction between different cultural areas is a major problem in the history of science. The study of this problem, specially science in the Middle Ages, is beset with certain difficulties. Unlike the case of sciences of the ancient Greece and modern times, a great number of treatises kept in numerous libraries have not been studied yet. Take the case of about 60000 manuscripts preserved in the library of the Asiatic Society. How many of these have been studied or annotated. Besides, many manuscripts have not yet been discovered. Moreover, treatises of that period contain very few references and preceeding works.

There are other problems in the study of ancient Indian history and specially so of history of science. Ancient knowledge is available in different classical languages and in a number of languages that developed during the period.

The scientific literature is available in Sanskrit, Pali, Arabic, Persian, Tamil, Malayalam and number of other languages. So far as technological tradition is concerned it evolved through apprenticeship and written records are few and often inadequate. Very little work has been done on the manuscripts available in Persian and Arabic languages. A glance at the book "Science and Technology in Medieval India : a Bibliography of Sanskrit, Arabic and Persian" by A. Rahaman *etal* will show how many manuscripts lie unstudied in our libraries and archives.

In many cases original texts have been lost and we know it through translations or referred by others. Take the case of the famous Central Asian mathematician al-Khwarizmi's "Zij al-Sindhind", also known as "al-Zijal Khwarizmi" or "Zij-al-Mamuni". The original Arab text has not been found. The Zij has come to us in Latin translation done by Adelard of Bath in 1126 A. D. at Toledo. But Adelard translated not the original but its edited version. Editing was done in Cordoba in the 10th century A. D. by Maslawa ibn Ahmad al-Majriti, a Spaniard-Arabian astronomer (died about 1007 A. D.). This translation has come to us in several manuscripts now available in various libraries- Bodlian Library, Charte Public Library, Madrid National Library, Cambridge etc.

A close look at the tradition of India would reveal that India was at the crossroads always giving to and receiving from the world of science and technology, ideas and techniques. Indian scientific tradition represents a truly international tradition, a synthetic tradition and I think

this is true of all cultures. The contact has a very old history from the proto-historic and may be from the pre-historic period. There was trade between India and Babylon during the Harappan times as evidenced by the Harappan seals found in Mesopotemia. In Indo-Babylonian trade Persia played a very important role. Due to the military conquests and expeditions by the Persians, Greeks, Indo-Greeks, Parthians and Kushans the contact with the outside world extended and the basis of the exchange of ideas were established.

It is not possible to guess how much the Ionian Greeks learnt about Indian culture, philosophy and the sciences through the Achemaenian empire. But, there are similarities in Greek and Indian thought about transmigration of soul, life after death etc. Pythagorean Brotherhood has similarities with Indian 'Sanyas Dharma'. The ideas expressed by Hippocrates regarding winds in his "Treatise on winds" and Plato in "Timaeus" and 'Republic' have similarities with Indian thought. There are lot of similarities between Pythagorean and Indian mathematics. We find exact enunciation of the Pythagorean theorem in the 'Sulvasutra'.

I am tempted to quote here from the lecture delivered by the late prof. Suniti Kumar Chatterjee at the 82nd Foundation Day Celebrations of the Bangiya Sahitya Parishad on 25th July, 1974. He said "the basis of dirct contact between India and Greece was laid in the Greek Hellenic or ancient Greek era. There is reference in Greek text that an Indian scholar had discussions with Socrates in Athens. This

contact became more intimate after Alexander's invasion and there was exchange of scholars from both countries. Greek philosophers like Pythagoras had come to India a century before this and the influence of India, spiritual thought, theory of rebirth, vegetarianism etc. affected the Greek philosophical thought. These influences percolated to Greece in a thin stream. The Neo-platonists philosophers were also influenced by India and some of them visited India too. Gradually, the ancient Greek religion came to an end and devotional Christian religion replaced it. This new formed Christian religion had direct and indirect impacts from Indian religion the doctrine and the quest of life of the Essense and Therapeutai and specially the asceticism and yogic practices practised by them gradually entrenched its place in the early Greek Christian beliefs and practices."

Pythagoras (about 580 B. C.), according to his biographer Iamblichus, travelled widely studying the esoteric teaching of Egypt, Assyrians and even the Brahmins. It is more likely that Pythagoras was more influenced by India than by Egypt. Almost all the theories religious and philosophical and mathematical taught by the Pythagoreans were known in India in the 6th century B. C. and the Pythagoreans, like the Buddhists and the Jains, refrained from the destruction of life and eating meat, regarded certain vegetables, such as beans, as taboo. The most startling of the theories of Pythagoras was that of the transmigration of the soul from body to body. Transmigration first appears in the Brāhmaṇas and Upanishada. The essence of the teaching is that the individual is an emanation

of the world soul which entering on a cycle of terrestrial incarnations, passes from body to body in a seemingly endless rounds. Greek Orphism and the later developments and Indian transcendental philosophy abound in parallels.

The noble prayer of the Upanishad,

"From the Unreal lead me to the Real
From Darkness to the Light,
From Death to Immortality"

finds many an echo in Platos "Dialogues."

Megasthenes was greatly impressed by the resemblance between Greek and Indian philosophy. Megasthenes wrote "In many points their teaching agrees with the Greeks for instance the world has a beginning and an end in time, that its shape is spherical ; that the Deity who is its Governor and the Maker, interpenetrates the whole.....About generation and the soul their teaching shows parallel to the Greek doctrines, and on many other matters. Like Plato, too, they interweave fables about the immortality of the soul and the judgements inflicted on the other World, and so on." Megasthenes repeatedly visited Pataliputra. Bindusāra maintained an amusing correspondence with Antiochus I. Bindusāra asked him to buy and send him samples of Greek wine, raisins, and a Sophist to teach him how to argue. Antiochus wrote in reply, saying that he has pleasure in sending the wine and the raisins, but regrets that 'it is not good from among Greeks to trade in Sophists."

When Alexander led his expedition to the East he had on his staff a number of trained historians and scientists. In India Alexander's first halt was at Taxila. Taxila was of

special interest for the scientists in Alexander's train, as being one of the leading seats of Indian learning. With the extensions of the Kushanas from the lst century A. D. a cosmopolitan culture, borrowed from Ionian, Hellenistic, Indian and Chinese sources, sprang up along the Central Asian trade route, with its centre in what is now the desert between the Tarim and Khotan rivers. It is difficult to establish direct proofs of such contacts. But, in the field of ancient sciences there are lot of internal evidences which prove that there was close exchanges between Indian and Greek scholars in the fields of astronomical and mathematical sciences.

J. Warren in his book "Kala Samhita" published in 1825 has recorded the astronomical lore of the Tamil inhabitants of the Coromondal coast. Warren had travelled extensively in Southern India. Warrn described in his book a method followed by the Tamil inhabitants of Coromandal coast for the computation of the lunar motion.

6th Nengebauer has observed that the terminology as well as the methods of Indian astrology are clearly of Greek origin ; For example the names of zodiacal signs are Greek loan words. But E. Burgess in his translation of "Surya Siddhanta" has noted "The use of this division, and the present names of the signs can be proved to have existed in India at as early a period as in any other country ; and there is less evidence, less clear and satisfactory, it is true, yet of such a character to create a high degree of probability that this division was known to Hindu countries before any traces can be found in existence among any other

people". Hence, we find that there is controversy. The basic concepts of 'Surya Siddhanta', the canon of Indian astronomy, was closer to the Greek epicyclic models.

The Coromondal coast from where the information about Tamil astronomy had been noted by J. Warren was a centre of Roman trade. We have ample evidence of this in the anonymous "Periplus of the Erythrean Sea" written in the lst century A. D. which contains a detailed account of the commerce between Egypt and India. This is fully corroborated by the archaeological evidence at Arikamedu in the outskirts of Pondichery. This contact with the West had its climax in the time of Augustus (1st century B. C.) and in the 1st century A. D. But the Roman coin hoards reach into the 4th century A. D. All this is confirmed by the repeated reference to 'Yavanas', i. e. Ionians' for 'Greeks' in Hindu astronomy and Tamil literature. Periplus speaks about 'Greek' ships sailing for India.

All the internal evidence of astronomical theories points that the Indian astonomy had impact from the Babylonian astronomy of the Selucid period through the Hellenistic astronomy and through the Persian civilization of the Sassanid period. 'Surya Siddhānta' contains the command of Sun to Maya "Go therefore to Romaka city, your own residence ; there, undergoing incarnation as a barbarian, owing to a curse of Brahma, I will impart to you this science". This is clearly paralleled by a passage in the 'Pancha Siddhāntikā' in Varāhamihira, "The Greeks, indeed are foreigners, but with them this science (astronomy) is in a flourishing state" (Bṛhat Saṁhitā). Sūrya Siddhānta is

dated by the modern scholars to about 400 A. D. Neugebauer writes in his book "The exact sciences in antiquity". "what are known about the Romaka and Paulise Siddhānta from the material which was incorporated in the 'Pañcha Siddhāntikā" seems to bring these treatises closer to the Hellenistic sources". The 'Romans' were the Greeks of the Roman or Byzantine empire ; and al-Biruni considers the Paulisa Siddhānta the works of Paulus Alexandrinus, an astrologer of the fourth century A. D. Thus we again obtain as the period of contact roughly the time of origin of the Sūrya Siddhānta i. e. about 400 A. D. "George Sarton in his "Introduction to History of Science" corroborates it. But it is difficult to prove it. There is increasing evidence that the pre-Ptolemaic astronomy and astrology reached Persia. Astronomical writings of Teukros and Vettius Valens were translated in Pehlavi, the pre-Islamic or Middle Persian Iranian language. It may be that it is through Persia the Hellenistic science reached India. But more research is needed to find out evidences of the exchanges between India and the Greeks in the field of sciences. Neugebauer says "For every specific question of astronomical or mathematical theory we are still groping in the dark because of deplorable lack of edited source material".

We may now turn our attention to the cultural and scientific relations beteen Central Asia and India which are very old. These relations developed from close economic contacts dating from remote past. The relation was particularly strengthened in the period of the Kushān

reign which united vast Central Asian and Indian territories. It was during this reign that Buddhism penetrated into Central Asia. The tradition of the Indian cultural intermix with the Central Asian culture was preserved in Khwāruin for a long period. The real contacts between Indian sciences with their counterparts in Central Asia belong to this period.

It is worth while mentioning that al-Mamun, whose Khalifat between 813-833 known as the Golden Age of Islam, was the deputy to the Khalifa of Baghdad in Merv in Central Asia. He had gathered in Merv a host of scientists and scholars like al-Khwarizmi, al-Farghani, Habsh al-Hasib. When al-Mamun became the Khalifa at Baghdad he took all these scientists and scholars to Baghdad. He also gathered at Baghdad scientists and scholars like al-Kindi of Yemen, Ibn Qurra, a Mesopotamian Arab, at Buzani, an Iranian, Banu Musa brothers also from Iran and many others in his 'Bayt al-Hikma' or 'House of wisdom'.

By the time the Persian emperor Cyrus was called into the Babylonian heartland in 539 B.C. to save the country from civil war, Babylonian astronomers had already divided the sky into 12 constellations, 30 degrees apart, in a circle of 360° and laid the basis of Zodiac. Persians developed the Babylonian astronomy to more scientific observations and from 300 B.C. the Chaldean star tables were developed. These Chaldean Tables formed the basis of Ptolemy's work in the 2nd century A. D. called the mathematical Syntaxis", later known as 'Almagest' (al-Majisti in Arabic).

Ptolemy's Almagest was translated into Pehlavi during

the rule of Shapur I between 240-270 A.D. The astronomical tables known as 'Yij' started appearing in Iran and Afghanistan from about 450 A.D. onwards having such names as 'Zij-i-Shah' or 'Sharujaran', 'Zij al-Arkhan', 'Zij al-Harkan' etc. All these Zijes showed pronounced influence of "Surya Siddhanta", 'Brahmasphuta Siddhanta' and 'Khandakhadhyaya' of Brahmagupta.

It is needless to mention here that India gave to the world the numerals, the decimal place value system and the concept of zero.

The first clear indication of the use of Numerals and arithmetical computation system is available for the first time from the writings of Severus Sebokht (mid 7th century). Sebokht was born in Nisibus in Syria. He was a Syrian bishop in the great intellectual centre in Jundishapur in Persia. Jundishapur became the haven for Nestroians and other Eastern heretics like Monophynites. Sebokht praised Indian astronomy and remarked on how excellent their calculations were because they used nine different sings for the first nine digits. Sebokht wrote, "I shall not discuss the sciences of the Hindus who are quite a different race comparad to Syrians. Even I shall discuss about their astronomy which they have surpassed Greeks and the Bobylonians for their very fine discoveries. But I cannot withhold without refering to their computational metheds. This computation is done only by nine signs. Those Greeks who think that they have reached the pinnacle of science let them try to be acquainted with this information (Hindu numerals). Then only they will understand that there are many other races who has some competence in science and learning."

There is no doubt that the Arabs learnt the Indian numerals and decimal place value system for Severus Sebokht when Islam spread from Central Asia to Spain within 100 years after the death of Muhammad in 632 A.D.

The Arabian historian Ibn al-Qifti who lived in the 13th century described the visit of an Indian scholar to the court of al-Mansur as follows : "In the year 156 (Hizra year) a man from India came to Khalifa al-Mansur. The man knew the calculus called 'Sindhind' about the heavenly body movements. Al-Mansur ordered to translate the book into Arabic...This task was undertaken by al-Fazari, who composed a book that is called by astronomers "great Sindhind". People of that time upto the days of Khalifa al-Mamun used the book. Al-Khwarizmi abridged this book."

Al-Biruni in his work "India" writes "The methods of the sun and moon diameter calculation which are presented in Indian Zijes such as "Khandakadhayaka" and "Karanasara" are the same as one that we find Khwarizmi's Zij." Biruni's writing testify to the fact that while composing "Siddhanta", al-Khwarizmi worked on several Indian 'Siddhantas' not strictly following any one of them. It also agrees with the information of Ibn al-Qifti given earlier. It can thus be concluded that even some centuries later Khwarimi scientists did appreciate the importance of Indian scientific legacy for the development of astronomy in the Islamic countries.

The Islamic scientists of 8th-10th centuries A.D. also played an important role in spreading the Indian achievments in mathematics to the West. It is the Arabic scientists who transferred the idea of decimal place value system, the Indian

numerals and the concept of zero to the West in the 13th century A. D. This system had tremendous impact on mathematical computation.

The first work based on Indian system was the book called "Book about the Indian Calculation" written by no other person than al-Khwarizmi. In this treatise by al-Khwarizmi the method of any number was the representation by nine digits and a special sign, i.e. "a small circle" meaning zero. Khwarizmi said that "Indians used it for convenience and brevity, simplifying the things for those who studied arithmetic."

In Europe the Indian method of arithmetical computation got the name 'algorithm', a corruption of the name of Khwarizmi, known as al-Chorizmi in West.

The cultural and scientific contact between India and the Islamic world continued in the 10th-11th century A.D. too. The finest example is that of al-Biruni (973-1048 A,D.). Apart from his famous 'India' that became a handbook for investigators on India of all subsequent centuries al-Biruni devoted to such works as "Arabic Khandakhadhyaya", "Indian imagination of both eclipses", "Zij brilliance", "Al-Arkands' Zij improvement", "Indian Rankas", "Answer to the questions of Indian astronomers" etc.

Biruni writes in 'India' that "they had so many books that it was nearly impossible to count them."

Al-Khwarizmi's 'Zij' was the first Zij which in Latin translation became popular in Western Europe, not only in Spain but even in England. The "Toledan Tables" compiled probably by a group of Spanish-Arabian and Jewish

astronomers, who carried observations in Toledo in 1060 A.D.. were influenced by al-Khwarizmi's Zij 'Sindhind'. In fact, the whole series of Andalusian texts, the majority of which is connected to some degree with the activities of al-Zakrali, inclines towards al-Khwarizmi's tradition of "Sindhind".

It can thus be asserted with sufficient grounds that al-Khwarizmi's Zij 'Sindhind' became a part of the body of knowledge and methods which formed the foundation of astronomy in the epoch of Renaissance, later on, the Copernican model formed on this basis.

The cultural contact with Islamic areas in the field of science was not one sided. Mathematicians and astronomers of Islamic countries also made an impact upon Indian scholars.

First, Indian mathematicians and astronomers were definitely familiar with Arabic translations and revisions of the works by Euclid, Archemedes, Appolonius, Ptolemy. Diophantos made between the 9th and 12th centuries A.D. This is testified by the manuscripts of these translations found in different Indian libraries. These were for instance, the Arab version of Euclids' 'Elements' and a number of Archimedes' works, some of which have come to us only in Thabit ibn Qurras translation in the 9th century. This was also mentioned by al-Biruni. Later, the Arabic manuscripts of 'Element' was used for translating the treatise into Sanskrit.

Second, Indian scholars were familiar with many original treatises of Arabic mathematicians and astronomers. Mahendra Suri (14th century), Kamatakara Nilkantha

Jyotirvid (17th century) and others played an important role in acquainting Indians with the sciences of Islamic areas. They either translated scientific works from Persian or included elements of science developed by the Arabic scientists into their treatises based on traditional Indian methods. Thus, in the 14th century Mahendra Suri (1320) wrote a treatise on astronomical instruments based on Arabic and Persian sources and Nilkantha Jyotirvid prepared a treatise containing many scientific terms borrowed from the Persian language.

In 1616 A.D. Kamalakara wrote "Siddhanta Tarka Viveka" mainly based on the ideas of "Surya Siddhanta" but containing considerable material taken from Arabic and Persian sources.

In the 17th century Jagannatha (1652), astronomer to Swai Jai Singh, translated Euclid's 'Elements' into Sanskrit taking for a basis the Arabic version of al-Tusi (1201-1274 A.D.). This translation is known under the little "Rekhaganita". Jagannatha also translated ptolemy's "Almagest" which got the name of "Samrat Siddhanta".

Jai Singh (1686-1743), who built the masonry observatory, was familiar with the Indian Arabic and European astronomical systems. He studied Arabic translation of Euclid's "Element", Ptolemy's "Almagest" read works of al-Tusi, al-Gurgani, al-Kashi and Ulugh Beg (1394-1449). He knew about the works carried on in the Maragha and Samarkhand observatories. The results of all his observations in his observatories Delhi, Jaipur, Ujjain, Varanasi and

Mathura were included into his astronomical table "Zij Muhammed Shahi" which was based on Ulug Beg's Zij.

The cultural contacts between India and China have been well-recorded in history. I am excluding this from my presentations. It will perhaps be clear from my presentation that the world culture has been enriched through interaction and dissemination of knowledge between different cultures. In the present trend of fundamentalist revival in different parts of the world it is neccessary to study our past to understand the present so that we can plan our future better.

Witchcraft and Medicine Traditionally Used Among Tribes

R. K. Bhattacharya

Witchcraft or sorcery is use of 'magic' or in other words occult control of human problems caused by spirits, evil eye and sorcery.

Medicines are generally substances used for ailments or for restoration of health. Spells, charms and fetishes as well as various forms of witchcraft are in use in certain societies to restore and recover health. We may know of spells and charms, while the use of fetish is not as well known except to some extent in its Freudian sense. Fetish is used here to mean inanimate object or objects worshiped for their supposed inherent powers.

In India when we mention tribe, we mean Scheduled Tribe because tribe is constitutional category in our country.

The discussion is about traditional medicines of tribes and not medicines that tribes in congenial contemporary situation opt for which may be modern in nature. By congenial situation I mean the infrastructural facilities of medical assistance catering to larger populations.

The physical state of a person is related to his or her mental state and the relation is naturally dependent. To illustrate this I take liberty in relating one of Kipling's stories from **Jungle Lore**. On a spring day Mowgli found himself all by himself in a tree when all his animal friends of the jungle were not around him and he mistook his feeling of

loneliness as a kind of an ailment and wondered what he must have taken causing such sickness.

Man's mental world is culture specific including his reasoning and perception, even his physical state of body is made adaptive to his culture. How is reasoning culture specific—to illustrate I narrate here the findings of a team of linguists working in the steppes of Central Asia. In experimenting with a syllogism a villager was asked to answer the colour of sheep his neighbour would see visiting a village having only white sheep. The villager answered that this was something that the neighbour only could answered as how could he predict what someone else saw. Culture is described as a superorganic archetype. Culture shapes man's personality and it is through individual personality that culture is transmitted and sustained. Every human society has its own culture.

Man's trust in his reasoning and perception gives rise to his belief. Through socialization individuals in a society develop a trust in their own internationalization of practices and observances as experienced socially and this is resistant to the wear and tear of counter reasoning, especially when such arguments come from other cultures. This element of trust overrides realities and the arguments that challenge this trust are often perceived as alien or esoteric.

Any discussson regarding traditional medical practices of tribes focuses on the contrast with modern medicines, imbuing these practices with an element of esosterism and as being something beyond reason. In stead what needs to be studied is the way people or groups of people perceive

illness, reeovety, good health and prevention. These perceptions are so intimately related to one's socialization under the mutually reinforcing factors of individuality or personality and culture, that they not only influence one's mind but also the physiology. Human beings are capable of transforming primary physiological needs into complex secondary needs, (As a very elementary example, the hunger drive a very primary physiological drive is seen to be trantformed into a secondary complex drive, in which it is not just food that is sought, but the kind of ambience of food, the company sought in sharing food, the deliberate abstentions from food and the social taboos about various foods or foods at appropriate times and physical condition. Sex is one more complex where every society has well formed ideas about permissiveness and restrictions) thus establishing an organismic unity where the mind and body are integrated into one system. With this premise in mind, examining medicines and medical practices cannot be considered as something apart from people and their perceptions and to a large extent their socialization in the contex of their individual cultures.

Besides, any study in this sphere requires to take a wide angle view of the larger social matrix in which among other elements, the various elements of medical practices including sorcery and shamanism are enmeshed and woven in the cultural fabric. As examples I may cite from countless statements a few beliefs regarding the inherent quality of foods and their seasonal variations and the varieties of social prohibitions underpinning the socialization of individuals in

a particular society. With this perspective in mind, it becomes more essential to enquire into the medicinal practices among tribes in order to keep alive the scientific temper and discovet the links of continuity between traditsonal and modern knowledge.

II

The foregoing discussion aims at removing illussion of esoterism from our understanding of practices of medicines traditionally in vogue among tribe. It is this that frequently hinders scientific enquiry and research often falls into the trap of viewing the two worlds—traditional and modern as being discrete, discontinuous systems tinged with a vague, undefined sense of doubt as how such separation could come about, so weak are the links apparently.

Why are anthropologists interested in medicines traditionally in use among tribes—

1. It presents an ethnographic detail about tribes and fills the gaps in our knowledge about them.

2. It provides us with an opportunity to understand the working of human minds in various communities.

3. Most significantly it provides us with the tools of understanding to bridge the worlds of knowledge—traditional and modern, because the two can never be disparate, rather it is often one's ignorance of the liks that have made them disparate and discrete units functioning in whatever way, establishing their own individual range of influence in the minds of people. We come across cases of miraculous recovery with the use of traditional medicines which have a more tried and tested efficacy. When looking for the reasons, belief of the people seems the best plausible answer

though it leaves many dark patches and these medieines are thought to be endowed with magical elements.

III

A review of literature on tribal medicines reveals that there are roughly five major factors that are believed to cause illness—i) wrath of gods ; ii) micro organisms ; invasion by spirits ; iv) sorcery and black magic ; v) the result of some actions that may have disturbed the spirits of the place. There is in fact very little importance that is laid on infection. In all this the factor of providence dominates and man is forced to use something more than mere medicines to deal with such a force.

Our view of the belief of the tribals in their medicines may be reciprocated by their view of our belief in modern medicines.

This discussion does not vouschafe a 'back to Methusalah stance, in stead, to keep faith in whatever has been achieved and not to shift allegiance from one to another when one becomes unmanageable. It is more important to recognize that knowledge does not exist in a vacum but is the outcome of man's continuous endeavour to make better adjustments to his environment.

References

Illness and Response among South Indian Foragers, Peter M. Gardner, **Medical Anthropology**, Volume 16, Number 2, 1995.

Lisu : A Little Known Tribe of Arunachal Pradesh, A Mitra, 1993, Mittal Publication, New Delhi.

Cranial Surgery in Ancient India

TREPANATION OF SKULL

—Amiya Kumar Roychowdhury

Due to absence of any written records about trepanation of skull during protohistoric period prior to the Ayurvedic period, one has to depend on skeletal discoveries for any knowledge about cranial surgery. In a previous communication entitled 'Trepanation in ancient India.'[1] I mentioned about two such cases from tall and long-headed, early population of Harappa, unearthed from the Cemetery R37, representing the mature Harappan Culture (Fig. 1).

In the present communication, three more cases of trepanation of skull have been described. Of these three, two were obtained from the cemetery area (KLB 8) lying on the west of the citadal mound (KLB 1) of Kalibangan, another Harappan site in Rajasthan. Its date may be attributed to a period between 2370 to 2000 B.C. Another skull was recorded from Burzahom, a neolithic site in Kashmir.

Two skulls with definite trepanation have been found from Kalibangan. 1. The first skull (KLB 8 gr. 9) seems to be that of a child. On the right squamous temporal bone (Fig. 2) there are six marks of trepanation of which three have pierced through the skull while the remaining three are incomplete. There is a curvilinear track of superficial charring of bone measuring about 1 cm. extending between the two holes on the top. This charring further extends towards the parietal eminence. The charring could also be detected near the bottom holes on the squamous

temporal bone. The interior bottom hole is bigger, about 3 mm. in diameter, where two attempts were made with the trepan at the same spot. Three more trephine holes could be detected on the forehead (Fig. 3) near the glabella with evidence of charring extending between those holes. On careful examination, an increased, porosity of the bone around the trepanation sites could be detected, indicative of a diffuse vascular inflammatory reaction during the life-time of the subject.

This skull seems to have a slight bulge on the right temporal region as confirmed by the skiagraphy of skull (Fig. 3).

From the nature of the above findings it appears that the child had some intracranial space-occupying lesion under right parieto-temporal region. The healer, using a red-hot metal knife, made a curvilinear incision on the slightly bulging right temporal region. He then made two holes at the two ends with a red-hot trepan. Further attempts were made below but mostly it failed.

2. The second skull (Skull No. KLB 8, gr. 31) was of a middle-aged man. Near the posterior end of the temporal line of the left parietal bone (Fig. 4), two holes were made using the same type of trepan as in the first case. Around those trepanation sites, the surface of the bone shows the same type of increased vascularity as in the first case.

3. The third case of trepanation of skull was performed on one of the Neolithic pit-dwellers of Burzahom which is a northern neolithic site of Kashmir, situated at about 8 km. N-F from Srinagar, Radiocarbon analysis attributes

its squence extending from 4325 ± 120 to 2580 ± 100. Earliest occupation (Period I) has been ascribed to a period prior to 2715 B.C. The skull under discussion may be ascribed to Period II.

There were eleven attempts at trepanation. At the postero-inferior side of left parietal bone (Fig. 5), 5 attempts were made at close quarters. But mostly the attempts failed to pierce the skull. However, on other sites, holes extend through the entire thickness of the tkull. The diameter of the skull. The diameter of the trepanation sites varies from 5 mm. to 0 cm. Trepanation was made possibly by striking with a heavy hard solid tool having conical tip (approximately 5 mm. in diameter) using another percussion hammer.

Skiagraphy for this skull indicated that at least around one complete hole, a definite ring of a sclerosis of bone could be detected. This indicates its ante-mortem nature. It appears that the trepanation attempts were made at different sittings.

An examination of the skull shows that the left parietal eminence is more prominent than the right. The left mastoid process is definitely larger. One may infer that the subject had a left hemihypertrophy of the face or atrophy on the right side.

From the available materials we may now logically construct a hypothesis about the sequences of trepanation in ancient India. At the neolithic site like Burzahom, flint instruments of special shape were used for trepanation· The Neolithic method of trepanation was completely different from that of the Indus Valley sites,

In the Harappan sites, however similar operations were

performed with metal gouge as at Harappa[1] or with hot metallic circular trepan as in Kalibangan. In two skulls from Harappa obtained from Cemetery R37, the holes were much larger than the one from Kalibangan but similar to Burzahom. This was produced by a metal gouge with alabaster handle. These skulls show indications of disease. However, the skulls obtained from Area G of Harappa show evidence of charred holes in the skull which might have been produced during a massacre by thurstin; red hot metal rods through the scalp.

The Kalibangan examples are unique in the sense that there is evidence of the use of ; (i) red hot metal scalpel and (ii) red hot trepan of the nature of a circular saw. By this method the injury to the skull would be minimum. The guard of the trepan also prevented excessive injury. The instrument used possibly had some resemblance to a modern one used in cranial surgery ; similar trepan was found in ancient Greece, but at a later age[2].

There is a lacuna in our knowledge about this practice of trepanation of skull during the Post-Harappan and the beginning of the Ayurvedic periods. Very little information is available about trepanation of skull before the time of Jivaka (c. 500 B.C.)[3]. But this surgical procedure might have been practised on the skull even before Jivaka as we find a mention in the **Suśruta-Saṁhitā**[4] of **Tirjak** (lateral) incision which should be made on the temple. There is evidence that Jivaka practised craniel surgery. From Rājagṛiha he went to Taxila to learn cranial surgery from his teacher, Bhikṣu Ātreya and after returning, successfully operated on the crow of king Bimbisara[5]. It seems that they

mainly practised this technique possibly to extract maggots from the gangrenous swellings of the skull. In the **Bhoja-prabandha** it is mentioned that king Bhoja was successfully operated on the head for pain by two visiting surgeons. Would it be illogical to conclude that this specialised knowledge of trepanation of skull in Neolithic and Chalcolithic times was handed over later on to the Ayurvedic practitioners of ancient India ?*

1. Monthly Bulletin of the Asiatic Society, XV, 1973, pp. 1-4.
2. 'The Surgical Instruments of the Hindus' (Griffith prize essay for 1909). G. N. Mukherjee. Vol II-, pp. 119-120. Calcutta University.
3. Ibid Vol. I., pp. 231-232.
4. The Suśruta-Saṁhitā. Calcutta Edition, 1907 ; 2nd Ed. Varanasi. 1963. Vol. I , p. 39.
5. 'The History of Indian Medicine' (Griffith prize essay for 1911)., G. N. Mukherjee., Vol. III., pp. 686-687, 691-692, 698. Calcutta University.

* The Anthropological Survey of India provided the skulls for illustration.

Notes on the Vedic concept of healing of diseases

Professer Heramba Chatterjee Sāstrī

The **Vedas**, believed to have been breathed out by the supreme Spirit, Brahman and visualised by the ancient ṛṣis, may eminently deserve an outstanding place in the history of world literature as the oldest Indian and also the oldest Indo-Germany literary monument. On account of its age and sanctity, the **Vedas** are the fountainheads for understanding the spiritual life and culture of the Indians. Indisputably the oldest and the most important of all the works of the **Vedic** literature is the **Ṛgveda-saṁhitā**, which is a collection of 1028 **sūktas** (hymns), distributed over **maṇḍalas**. In short, the text is comprised of hymns addressed to deities which are mostly of the nature of invocations and glorifications of the godheads addressed ; their fundamental tone is a simple pouring out of the heart, a prayer to the Eternal, an invitation to accept favourably the gift consecrated with piety... What a god placed in his soul and made him feel : the singer wants to give eloquent expression to the urge of bis heart.[1] This much is certain that whatever may be the poetic content of the songs of the Ṛgveda, there is no more important source for investigating into the earliest stages of the development of the Indian religion, no more important literary source for investigating into the mythology of the Indo-Germanic people indeed of the peoples themselves, than these songs of the **Ṛgveda**.

From out of the information collected through these songs to the deities we may form some ideas about the **Ṛgvedic** Indians being associated with cattle-breeding,

agriculture, trade and occupation, as also with incest, kidnapping, adultery, deceit, theft and robbery, The cultural image which flows towards us out of these songs, has been described by Heinrich Zimmer in a masterly way in his **Altindisches Leben,** (Berlin, 1879). It shows us the Aryan Indians an an active, vivacious and pugnacious race of simple and partly still of rude customs'. From out of the stray references first in the **Ṛgvedic** hymns an honest attempt will be made to procure information as far as possible, relating to the medical sciences and the diseases in that pre-historic period. As is quite natural and traditional for India, the science of medicine has been ascribed antiquity and as such has been declared to be the creation of the Almighty himself. It has been declared in the **Carakasaṃhitā** that **Āyurveda** is to be regarded as eternal in nature :

Se'yam āyurvedah śāśvate nirdiśyate nāditvāt svabhāsaṃsiddha-lakṣanatvāt bhāvasvabhāvanityatvāc ca. 1. XXX.

The **Brahmavaivaprataurāna** has the following line of approach ;

Ṛgyajuḥ-sāmātharvākyān dṛṣṭvā vedān prajāpatiḥ
Vicintya teṣam arthañ caivāyurvedaṃ cakāra saḥ
Kṛtvā tu nañcamaṃ vedaṃ bhāskarāya dadu vibhuḥ,

Brahmakāra, Chap. XVI.

See also the information relating to the **Karṇāmṛtataila,** where after mentioning the preparation of the same has been held :

Nāmnā karnāmṛtaṃ tailaṃ brahmanā nirmitam savayam.

Interestingly we may refer to the fact that ancient nations like Egypt believe that **Thet** was the inventor of the

science. The Egyptian Theth was known to the ancient Greeks as Harmes and "Greek scholars trace the Greek Hermes to an Indian sources and assume the existence of two gods of the same name."

See, Wootton, Chronicles of Pharmacy, Vol. 1, p. 5.

In Greek literature, the earliest allusions to the healing art is found in homer, who represents it as derived from the gods. Herus was indentified by the Greeks with their Appollo and to him the discovery of the science of medicine is attributed.

In this background we may submit here that Rudra has been conceived of as a god of healing, having healing remedies, chief of which was **Jalāsa**, explained as Soma or rain. (Gāthapatiṃ medhapatiṃ rudraṃ jalāpabheṣajam,...RV. 1.43.4 ; see also RV. 1.114. ; VII.59,12 : where he has been addressed as contributing to nourishment : tryambakaṃ yajāmahe sugandhim **puṣ**tivardhanam). In the **Atharvaveda** Rudra has been described as hurting the enemies with fever, poison etc. 11.2, 22, 26).

Viṣṇu in the Purāṇic literature has been eulogised as a deity by mentioning whose name fever is removed :

Viṣṇuṃsahasramūrdhānaṃ carāearapatiṃ vibhuṃ,
Stavan nāmasahasreṇa **jvar**ān sarvān vyapehati.

Cakradatta, 1. V, 183

In the Bower Manuscripts, p. 188 he has been referred to as the deviser of Siddhārtha (or efficacious) oil. In the Rgvedic concept he protects the embrye (see R. V., X. 184. 1-3).

The same Bower manuscript, at p. 169 records a conversation, where Dhanavantari was asked whether there was any medicine capable of curing all the diseases, to which the reply was in favour of the Plubage-plant. Viṣṇu is traditionally to be remembered at the time of administering medicine in general (auṣadha cintayed Viṣṇu). Through the verses addressed to Viṣṇu (R.B.X. 184) we learn that the Vedic Aryans had a clear concept of the processes necessary for the protection of the ambrye, for which serious efforts and caution were contemplated (Viṣṇur yoniṃ kalpayatu, tvaṣṭā rūpāṇi piṃśatu etc), In this act Viṣṇu was assisted by the Aśvinas (garbhaṃ te aśvinau devā vādhattāṃ puṣkarasrajā. X. 184. 2).

That the seers were very much conscious about heart-disease as also the special disease of yellow colour of the body is clear from the prayer to the sun for curing these diseases :

X.50,11-13 : Hṛdrogaṃ mama sūrya harimāṇaṃ ca nāśaya.

They were also conversant with the disease in eye for which the **Atharvavedic** seer looked up to the sun : sūrya cakṣur vataḥ prāṇaṃ puruṣasya vibhejire. A.V. 11. 8, 31 (Cf. Plate, Republic, VI. 18 where Secrates apeaks of the eye as having clesest affinity with sun),

Through the prayers to Indra we came across the concept of cure from the dangerous disease of phthisis :

R.V. X. 161 : muñeāmi tva haviṣā jīvanāya kma ajnātayakrma uta rājayakṣmāt. There was even refcrence to bringing back to life even a dead patient (X. 161.2). There is reference to Indra's power of bringing back the

destroyed (X. 161,5 : sarvāngaṃ sarvaṃ te cakṣuḥ sarvam limbs when ayuś ca te 'vidam.

Even the remedy for balances was contemplated (VIII. 91).

To the goddess Sarasvatī the Ṛgvedic seers looked for aid to protect the embrye (garbhaṃ dhehi sarasvatī R.V.X. 184.2) and in later literature Sarasvatī has been ascribed the speciality of removing sterility in a woman and seminal insufficiency in men :

Aprajānāṃ ca nāriṇāṃ narāṇāṃ svalparetasām
Ghṛtaṃ sārasvatam nāma sarasvatyā vinirmitam.

The short article is proposed to be given finishing touches by referring to the Vedic surgeon and medicinal doctors, namely, the twin Aśvinas. Amongst their specialities we may refer to their art surgery where they substituted an iron leg which was severed in battle in respect of Viśpalā:

R.V.I. 116.15 : sadye janghām : āyasīm vispalayani dhane hite sartave pratyadhattam.

They cured through medicine the blindness of Ṛjrāśva cursed by his father X,1.116.16 : tasmā akṣīnāsatyā vicakṣa adhattam dasrā bhiṣajāv anan van. They had the special power of bringing youth and virility to the old persons also, as we gather from the story of Cyavana whose old age was removed and after rejuvination he became acceptable to his young wife Sukanyā (R.V.I. 116.10).

It is possible thus to show that the Ṛgvedic Indians had sound knowledge of some important diseases and their remedy.

---

1. See, Ad. Kaegi. The Ṛgveda, the oldest literature of the Indians. Second edition, Leipzig. 1881 ; An English translation with additions by R. Arrewasmith. appeared in 1886.
2. For a different assessment of Ṛgvedic hymns, see, H. Oldenberg, Religion of the Veda, Berlin, 1894, p. 3.

Medical Practices as known from Early Pali Literature.

Prof. Binayendra Nath Chaudhury

The early Pali literature comprising the Canonical Pali texts and Milindapañha sheds abundant light on the development of ancient Indian medical science, tekiccha-satha (cikitsā śāśtra) or Āyurveda during the period from the time of Buddha down to the first century B.C. This great science had developed on two different lines, namely, general treatment of healing (tekiccha) and surgery (sallakattiya). The early Pali texts have mentioned different branches of medical science such as salakiya (Sanskrit śālakia in Suśruta) or ophthabrology, sallakattiya, darakatikicchā (art of infant healing), visavijjā (Skt. viṣavidyā) i.e. treatment of poison cases, poisioning due to biting by snake (ahivijjā), scorpion (vicchikavijjā), rats (musikavijjā) etc. and even the veterinary science dealing with treatment of animals as a side development of the Āyurveda. Besides the medical sciences mentioned above, the Brahmajāla sutta of the Digha Nikāya (I, pp. 9-12) refers to another popular art of healing, bhutavijjā i.e. the art of curing a person overtaken by ghosts by chanting charms (mantras).

The Satipathana sutta of the Majjhima-nikāya bears ample evidence to the development of the knowledge of anatomical details of the human body. According to the local custom in ancient India, the dead bodies were generally thrown away in cremation ground (sivatthikāya) to undergo the natural process of decomposition or to be devoured by

carnivorous animals or birds and the dead bodies could be found there in various stages of disintegration at last remaining scattered bones of different parts of the body. The knowledge of embryology dealing with the process of conception and gradual development of the foetus in the womb and the subsequent stages of development of the child after birth is revealed in the early Pali texts. The doctors of the period were conversant with the knowledge of the body. The medicinal plants, minerals, organic and inorganic substances and their properties, diseases (abadha or roga) and causes of their origin (nidāna), the selection and preparation of drugs for remedy and their application.

We find in the early Pali texts various terms like 'vejja' (vaidya), 'tikicchaka' (cikitsaka), 'bhisakha' (bhiṣaj) and 'sallakatta' (śalyakatṛ) to disignate a physician. These words are found in the Jātakas. Anguttaranikāya, Majjhimanikāya, Samyuttanikaya, Vinayapiṭaka and the Milindapañha. From the practical point of view these medical practitioners might have been different from one another in the daily life of the society. But the first three terms, vejja, tikicchaka and bhisakka do not show any difference among them and they were indiscriminately used in the Pali texts. Sallakatta i.e. a surgeon, who did surgical operations was different from the other three types of physicians. A Jātaka refers to 'hatthivejja' i.e. elephant doctor, A surgeon might also had been a physician and so the terms bhiṣakha and sallakatta have been used combindly to denote a physician who was equally conversant with both medicine and surgery. Besides the physicians mentioned above there were also bhutavejja i.e. practioner of exorcism and ahigunthika i. e.

snake-charmer or snake-doctor who held a high position in ancient Indian society. There are sufficient textual evidences to shhow that the medical practice (vejjakamma) was a recognised profession in ancient India. Besides the physicians who were engaged in healing the public and took fees (vejja-vetana), there were also royal physicians (raje-vejja) who attended the royal house.

The physicians were highly esteemed in the society for their humanitarian services by undertaking duties and responsibilities of medical treatment. The Jātakas and the Milindapañha mention the names of celebrated physicians who were the former teachers of doctors (tikicchakanām pubbaka ācāriya), viz, Bhoga, Vetarani, Dhammantari, Sivaka, Nārada, Angirasa, Kapila, Kandaggi-ssama, Atula and Pubbakaccayana. Of these physicians Nārada is probably identical with the mythical seer (Devarşi) of the same name found in the Vedic literature. Dhammantari (Dhanvantari) along with Vetarani and Bhoja were well-known healer of old days in cases of snake-bites. He may be identical with Kaśyapa Dhanvantari, a Brahmin proficient in toxicology mentioned in the Mahābhārata (Ādiparva, ch. 42). The name of Angirasa is found in the Atharvaveda ; Kapila may be identical with the famous physician named Kapilabala who is quoted by Bāgbhaṭa in Aşṭānga Saṁgraha, I, XX and the rest of the physicians mentioned above cannot be identified. The Vinaya Mahāvagga gives account of Jīvaka Komarabhacca the most famous physician and surgeon in the time of Buddha and Ākasagotta, a surgeon. Ākasagotta is also mentioned as surgeon at that time.

According to the Milindapañha (pp. 247-49), a successful doctor is one who is "a true follower of the sages of old (sabhāva-isibhattiko) one who carries in his memory the ancient traditions and expert in mantras (sutamantapadadharo), not a fool but a practical man (atakkiko), skilled in the origination of diseases (roguppattikusalo), his cures efficacions and lasting (amoghadhuvasiddhakamo), and who has collected medicines for allaying all diseases (sabbarogupasamabhesajjanis sannipatesi). A man who is severely ill (paramabyādhita) should go to such a physician for treatment, Again, according to this text, p. 194) "a physician when an invalid (āturo) is to be visited, should inspect beforehand his age (bhisakassa pubbe va āyum Oloketya āturo upasankamitabbo)." An ideal physician and surgeon approaches an ill person, he does with whatever remedy by which the man is to cured (yena yena bhesajjena āturo arogo hoti , making one who is to have emetic have one (vamaniyam vameti), making, one who is to have a purgative take one (virecaniyam virecti) making one who is to be treated with ointment be so treated (anulepaniyam anulimpeti) and making one who is to be given an injection of fragrant oil be so treated (anuvasaniyam anuvaseti).

Everyman wants to remain healthy and happy and free from diseases. But a man be afflicted by disease and illness which should be removed. So the Aryan sages beginning from the Vedic period developed the Āyurvedaśāstra to keep mainly human body free from diseases, healthy and active. Indigenous people also developed the art of healing

in their own way. Buddha as a religious preacher wanted his disciples to remain physically fit so as to observe moral precepts and follow the religious practices for spiritual progress and ultimately the realisation of Nirvāṇa (cf Nayamatma balahinena labhya). The first necessary thing to keep body healthy and active is to take moderate but nutritive food (Kavalisikara āhāra). So Buddha instructed his disciples in many discourses" come you, monk, be moderate in eating ; you should take food reflecting carefully, not for fun, or indulgence or personal charm or beautification, but taking just enough for maintaining this body and keeping it going, for keeping it unharmed, for being capable for Brahmavihāra". The Milindapañha (p. 320 and 417) furnishes a list of advantages or disadvantages due to good or bad food thus :

(1) Food is the support of all being (bhojanam sabbasattānam upathambho and also the sustainer of their life-span (āyudhāranam).

(2) food is the augmenter of the strength of all beings (sabbasattanām balavaddhanam),

(3) food is the producer of beauty (vanna-jananam) ;

(4) food is the alleviator of suffering (daratha vupasamanam) ;

(5) food is the remover of the weakness of exhaustion due to hunger (jighacchadubbalayapati.vinodam ; and

(6) food is much desired by all beings (bhojanam sabbasattānam abhipatthitam). Depending on food all beings llve at ease (āhārupanissitā sabbe satta

sukham anubhavanti). But this life-giving food, if not properly taken, destroys life because of its bad effect (āyudadam bhojanam durupacarena jivitam harati). Some people die of cholera due to over-eating (ati-Bhujitva visucikāya maranti) and some die due to bad digestion (usmadubbalatāya). The Milindapañha further says, "a meal turns unwholesome because of either the poorness of the stomach or the poorness of the food" (Kotthadutthataya va bhojanam visamam parinamati āhāradutthataya va). But generally, accoding to this text, "food carries the life of a man whose stomach is out of order and who has a sluggish and weak digestion (mandadubbalagahanikassa) because it is not properly digested. This is not a defect in the food, namely weakness in its heat" (na eso doso bhojanassa, Kotthassa eso doso, yad idam aggidubbalata).

As stated above Buddha laid stress on the sound body and alert mind of his disciples, so sick persons suffering from any of the five diseases, namely, leprosy (Kuttha), boil (gaṇḍa), dry leprosy (Kilasa) consumption (soso) and fit (apamara) were debarred from admission into the Sangha Mahāvagga p. 72). But it is quite natural that any member of the order might have been attacked by any disease and it happened so, so Buddha enjoined a bhikshu to keep medicine as antidote of disease of illness (gilana paccaya bhesajja) as one of the four supporting conditions (nissayas) and prescribed at the early stage to use urine and excrements as medicine (puti-muttabhesajja) and later on ghee (sappi) butter (navanita), oil (tela) honey (madhu) and molasses (phanita). Buddha himself attended sick

monks. So Buddhist monks in general acquired knowledge in the art of healing.

The early Pali texts throw abundant light on the names of various diseases and medicines for their treatment. The Brahmana-dhammika sutta of the Suttanipāta and the Milindapañha refer to 98 kinds of diseases (roga) without giving their names. The Anguttaranikyāa (V, 110) and the Niddesa (I, 360) furnish almost common list of diseases, but they do not altogether make up the number 98. The list of the Anguttara nikāya runs thus :

Cakkhuroga (diseases connected with eyesight), sotaroga (hearing disease). ghanaroga (nose disease), jivhāroga (tongue disease), kāyaroga (body disease), sisaroga (head o), kanna o (ear o), mukha o (mouth o), danta o), (tooth o), ottha o (lip o), kāsa (cough), sasa (asthma), pinasa (cold in the head), dāha (burning), jara (decrepitude), Kucchiroga (abdominal trouble), muccha (swooning), pakkhandika (Skt praskandika) i. e. dysentery or diarrhoea, sula (acute pain), visucika (cholera), kuttha (Leprasy), gaṇḍa (boil or abses), Kilasa (cutaneous disease), soso (consumption), apamara (epilepsy), daddu (Skt. dadru, a kind of cutaneous eruption), Kandu (itching), Kaechu (scab), sita (skt. sila, ie.e. cold) unha (Skt. uṣṇa i.e. (heat), jighaccha (hunger), pipāsā (thirist) uccara (excrement trouble), passava (urine trouble), nakhasa or rakhasa (a disease at the place scratched by nails), vitacchika (Skt. Vicarcika i.e. scabies), lohita-pitta (blood in the file), madhumeha (diabetes) amsa (Skt, arśa, probably piles), pilaka (a kind of boil), bhagandala

(an ulcer, a fistula), pitta samutthana abadha (disease due to bile), semhasamutthana abadha (diseases due to phlegm), vatasamutthana abadha (diseases due to wind), utuparinamaja abadha (diseases due to change of season), visamapariharaja abadha (diseases due to attack of adversities), sannipātika (disease resulting from the union of humours), opakkamika abadha (pain attacking suddenly, spasmodic disease) and Kammavipakaja abadha (diseases due to past karma or action), In the list of the Niddesa ottharoga is omitted and diseases due to mosquito, raptiles, wind, heat, etc. (damsamakasa valatapa sarisapasamphassa) are added. Besides the diseases mentioned above the Pali texts refer to other diseases such as pānduroga Jaundice), Lohita pakkhandika (blood dysentry), thullakcchu (thick scab), tinapupphakaroga (hay fever, illness due to grass flower), udaravatabadha (illness due to wind in stomach), ahivataka-roga (snake-wind sickness") pitthivata (pain in back) saradika badha, etc.

Treatment of Diseases.

The early Pali literature throws light on the specific medical treatment of many diseases mentioned above. The Bhesajja-khandhaka of the Vinaya Mahāvagga describes some such diseases, their antidotes and preparation of medicines of them. The prescription of course, according to Buddhist tradition, came out from the mouth of Buddha. The symptoms of the 'sarodika disease' which broke out in the Autumn season is vomitting of rice-gruel (yāgu) and rice (bhatta) eaten by the monks and as a result they becamee lean (Kisa), wretched (lukha), of a bad colour (dubhana), yellowish (uppandu pandukajala) and the

veins standing out on their limb (dhamani santhatagatta). The remedy prescribed for this disease is five kinds of things, viz., Ghee (sappi), fresh butter (navanita), oil (tela), honey (madhu) and molasses (phanita) which are recognised as both food for nutriment (āhāra) and medicine (bhesajja) to be taken twice daily in the morning and the evening (kāle ca vikāla ca) prepared just before use. If these are taken at one time, indigestion appears with this disease and the condition of the patient might have deteriorated.

This Khandhaka describes the following things to be used as medicine whenever necessary, viz. the use of cooked fat (vasa) of bears (accha), alligator (susuka), pig (sukara), and donkey (gardabha) ; use of roots (mula of termeric [haliddi), ginger (singivera), orries (vaca), white orris (vacatha), garlic (ativisa), black hellebore (katukarohini), Khus Khus (usira), nutgrass (bhadda-muttaka)—these roots pressed or unpressed to be preserved with the patient and use of large or small grindstone for pressing ; use of astringent decocktions (kasava) of nimba, Kuṭaja ; pakkava (a creeping plant), nattamala, etc., use of leaves of nimba, kuṭaja, cucumber (patola), basil (tulasi), cotton tree (Kappāsa) etc. ; use of fruits of vilanga, pepper (pippali), black paper (marica), yellow myrabolan (haritaka), belaric myrabolan (vibhilaka), emblic myrabolan (amalaka), gotura, etc. ; use of resins (jatu) of himgu, himgujatu, himgu gum, lac, etc. ; use of varities of salts, viz., sea-salt (samudda), black salt (Kalalona), rock-salt (sindhava), eulinary salt (ubbhida), red salt (bila), etc.

For the disease like Thullakacchu, because of the discharge of which robes are stuck with body (tassa lasikaay

civarani kāya lagganti) and the monks have to use watet repeatedly to loosen, and other diseases like Kandu, pilaka, assava (a running sote), and for one whose body smells nasty (kāyo duggandho) chunam (medicinal powder), dung (chakana), clay (mattika) and boiled colouring matter (rajananippakam) were prescribed for one who was not ill (agilana). In this connection a pestle and a mortar (udu kkhala-musala) for pressing, a chunam-shifter (cunna-calini) and a cloth-shifter (dussa-calini) were allowed. Elsewhere a perfume-paste was allowed for a skin disease. In the Cullavagga (p. 106) the using of an unshaped scrubber (akatamallakan) at the time of bathing to get comfort was allowed to scab-diseased monk.

Different kinds of ointment (añjana) such as kālañjana (black collyrium), rasāñjana (rasa collyrium), sotañjana (sota ointment collected from river), geruka (yellow ochre or red chalk) and Kapalla or Kajjala (lamp-black) mixed with powders of sandal-wood (candana), rosebay (tagara), black gum (Kalanusare), talasa and nutgrass were prescribed for healing cakkhuroga, This collyrim is to be preserved in various kinds of ointment-boxes (añjani) made of bone atthimaya), ivory (dantamaya), horn (visanao), bamboo (velu), reed (nala), piece of stick (kattha), crystal (phalika), and conch-shell (sankha) (except gold or silver for Buddhist monks) covered with lids (apidhana) and tied with thread (suttakena bandhitva). The use of ointment stick (añjanisalāka) for applying medicine in the eye and a bag to carry the box were also allowed. In the Cullavegga (p. 107) an eye-diseased person in advised to anoint his face.

They had disease called sirabhitapa (literally means 'heat in the head') may be regarded as headache due to heat with which Pilindavaccha was suffering. Buddea at first prescribed medicinal oil to use on head (muddhani). At its failure Budha allowed medical treatment through nose (natthu kammasy) by double nose-spoon for proportionate pouring of oil. Even the patient did not get better and then he was advised to inhale steam (dhumam palum) by smoking pipe (dhumanetta).

Jivaka cured a merchant's wife at Saketa who was suffering from head disease (sisabadha) for seven years by pouring handful ghee boiled up with various drugs (nānābhisajjehi nippacitva) into her nose after she was made lie down on her back. When ghee came out through her mouth she felt easy. A Jātaka story describes healing of headache by applying on the forehead some leaves of a medicinal plant, after these were ground on a slab and mixed with water.

Pilindavaccha was suffering from affliction of wind (vātabadha) in stomach. He was advised by physicians and allowed by Buddha decoction of oil (telapake) mixed with limited strong drink (majja) free from colour, smell and taste (na vanno na gandho na raso) Elsewhere in the Bhesajjakhandhak (Mahāvagga, p. 210) lonasoviraka (salted sour gruel)and tekanulayāgu i.e. conjey containing the pungent ingrediets of sesamum (tila). rice-grain (taṇḍula) and kidney-been (mugga) were prescribed to remove affliction of wind in the stomach (udaravalabadha).

For the healing of rheumatism in limbs (angavatā) at first sweating-treatment (seda-Kammam) was prescribed. At its failure, sweating by the use of all kinds of herbs

(sambharaseda), which, according to Samantapasadika 1091) is sweating by the use of hemp and a variety leaves' was allowed. At its failure great sweating (mahāseda) was allowed. Samantapasadika (1091) "explains that they heap charcoal into a pit the size of a man, cover it with dust, sand and leaves and the patient lies down there with his limbs smeared with oil and sweats by rolling round". On its ineffectiveness the use of hemp-water (bhangodaka) the patient was asked to sprinkle himself water boiled with hemp-leaves. Even at its failure the application of the sweating treatment having got into a vessel filled with hot watet (udakakotthaka) was prescribed. In order to heal rheumatism in the joints (pabbavāto) it was at first advised to let blood (lohitam mocetum) out of the affected place. At its failure it was asked to cup with a horn (visanena gahetum) after having let blood. When Pilindavāccha's feet came to be split (pada phalita honti) Buddha prescribed an unguent for the feet (padabbhanjanam) and at its failure the patient was asked to use a foot-slave (pajjam abhisankaritum).

For the sickness of body due to bad humours (abhi-sannakāya) prescription was given at first in the Bhesaj jakhandhaka (Mahāvagga p. 206) to drink a purgative (virecanam pātum), them to eat clarified conjey (accha-kanji) or unprepared broth (akata yusao) or prepared and unprepared broth katakāta or meat-broth (paticchadaniya) which, according to Vinaya Commentary is māmsarasa i.e. flavour of meat as required necessary, once Buddha came to have a disturbance of the humours of his body (kāyodo-sabhi-sanno). Jivaka at first advised to lubricafe Buddha's

body for a few days. Milindapañha also (p. 172) says that "a physician gives softening medicines when the body is full of humours and afflicted by them". After lubrication of Buddha's body Jivaka prescribe a light purgative of three handful of blue lotuses mixed with various medicines (tini uppalahatthani nānā bhesajjehi paribhavetra) for purging thirty times and advised to take hot bath after the 29th time so that Buddha would be purged full thirty times and also advised to abstain from alms food of juices (alam yusa-pinda patena) until Buddha comes to be normal. In the Cullavagga p. 119) it was advised to use jantaghara (hot bath room) and cankama vedikā (a balustrade in the Cloister) by those who were afflicted by this diseases.

The Bhesajjakhandhaka (Mahāvagga, p. 206) has pres-cribed to drink raw lye (amisakhara) prepared from powder of dry rice mixed with water in order to remove constipation (dutthagahanika). The Jātakas (vol. VI, p. 4, 3) prescribed a dose of ghee mixed with some medicines as purgative to remove constipation. After taking this, the patient was advised not to talk or work, but simply to lie down in bed.

In order to cure jaundice (pāṇḍuroga Bhesajakhandhaka the Bhesajjakbandhaka prescribes a compound cow's urine and yellow myrabalan (muttaharitaka), But Jivaka pres-cribed cooked ghee (Mahāvagga, p. 277).

In order to cure skin disease (chavidosabadha) it was prescribed to make a perfume-paste (gandhalepam katum). When Pilindavaccha's feet came to be split (pada phalita honti) and in order to come Buddha instructed to prepare

foot salve (pajjam abbisankha-ritum).

The Bhesajjakhandhaka prescribes to eat lotus stalks and fibres to cure kāyadāha disease for ever.

Treatment of snāke bite and diseases of poison.

Snake is a dangerous creature, the poison of which can cause death or severe diseases to man. In the Bhesajjakhandhaka (Mahāvagga, p. 206) drinking docoction of excrement (gutha) urine (mutta) ashes (charika) and clay (maṭṭika) has been prescribed to cure a person who is bitten by a snake (ahina dātthe). According to Jātaka (III, p. 346 ; JI, p. 215). The breath coming from the nostris (nāsāvāta) of black-snake (kanha-sappa) was believed to be very poisonous, causing blindness if it fell on the eyes. In the Vinaya Mahāvagga (p. 78) there is mention of a disease called ahivalakatoga, (it means "snakewind-disease") translated by I.B. Horner (The Book of Discipline, IV, p. 98) which caused death of whole family members except father and son. The Amba Jātaka also corroborates this fact. Perhaps this disease was something like epidemic due to virus in the air and no remedy has been suggested in the Pāli texts. According to the Jātakas (I.p. 310 ; II, p. 215 ; IV, p. 196 ; VII. p, 181.ff) snake-bites were cured.

The Bhesajjakhandhaka prescribes a drink of decoction of soil turned up by the plough to remove gharadinnaka disease resultiag from drinking something poisonous.

An instance of curing leprosy is found in the Magandiya sutta of the Majjhimanikāya (I, 506). A leper (kuttho), who with his limbs all ravaged (arugatto) and festering (pakkagatto) and who, being eaten by vermin (kimihi

Khajjamano), tearing his open sores with his nails, might scorch his body over a charcoal pit (angāraka kasuya kāyam paritapeyya). "The physician by preparing a medicine healed the leper, According to the Jātaka (VII, p. 383), a leper had to be carefully nursed. The spot was washed, a salve anointed to it and a bandage was put on it.

The Jātaka (VI, 295) further states that too much indulgence in sexual intercourse might cause various diseases like cough (Kāsa) asthma (sasa), bodily pain (daram) and childishness (bālyam).

According to the Jātaka (II, p. 213 ; III, 144) the treatment fot blood dysentary (Lohita-pakkhandika) was a broth made of millet and wild rice, mixed with leaves sprinkled with water, without salt and spice and irregular food was known to be one of the causes of dysentery. It was also recognised that proper digestion of food is not possible without proper sleep (Jātaka, III, p. 143) and indigestion (ajinna) is due to over.eating (Jātaka II, p. 362). Milk mixed with a pungent drug, if drunk, was recognised to ensure protection from getting cold (tikhina bhesajjaparivaritam khiram pivanti.....sitam na badhati (Jātaka I : p. 458).

Surgery :

Besides medical treatment development of delicate surgical operations in order to cure certain diseases is known from the early Pali literature. From the biography of Jivaka komārabhacca as depicted in the Mahāvagga, we know that he was renowned for his skill in surgical operation. Surgeons used knife or lancet (salla) for operation. Before operating the head of a merchant of Rajagṛha, Jīvaka made him lie down on a couch, strapped him to the couch, cut the

skin of his head and having opened a suture in the skull (si sacchavim uppateta sibbini vinametra) drew out two living creatures (dve panake dassesi) and then closed the suture of the skull and having sewn the skin of the head applied an ointment. After operation Jīvaka made him lie down for three weeks in three positions on his left side, right side and the back a week in each position and the merchant was cured.

On another occasion Jīvaka did a surgical operation in the abdomen of a boy at Benares, who "while playing at turning somer-sault, came to suffer from a twist in the bowels (mokkha-cikaya kilantassa antaganthabadho hoti) so that he did not properly diggest the conjey that he drunk nor did he properly digest the food that he ate or relieve himself regularly", Jīvaka came and observed the boy carefully, tied him fast to a pillar cut open the skin of his stomach, drew out the twisted intestines and disentangled them. He then put them back into their right positions sewed the skin of the stomach and applied ointment to the wound (a lepam adasi) and the boy was cured quickly.

Ven Pilindavaccha was suffering from rheumatism in the joints (pabbavāta), Buddha allowed to let blood using a knife or lancet and to cup with a horn (Mahāvagga, p. 205 ; Vinaya Atthakathā, 1991).

The Bhesajjakhandhaka cites a case of curing a boil (gaṇḍaroga) by surgical operation and application of medicine. At first astringent water (kasāyodaka) and sesamum oates (tilakakkha) were applied, then compress (kabalika) was given by piece of cloth. The sore itched (vono kanduvati) and for that mustard powder (sasakudda)

was sprinkled. The sore festered (Kilijjitha) and for that fumigation was made (dhuman Katum). The flesh of the sore stood up (vanamāmsa vuddhati) and it was cut off with a piece of salt-crystall (lonasakkharika). Then oil for the sore (vanatela) was applied and the sore was covered with a piece of linen bandage.

The Devadaha sutta of Majjhimanikāya (I 429) describes how a surgeon cured a man pierced by a poisonous arrow (savisena sallena viddho) and who experienced a severe pain. The surgeon cut round the opening of his wound with a knife and probed him for the arrow with a surgeon's knife (esaniya sallam esi) and extracted the arrow from him. Then the surgeon dressed the opening of his wound with medicated powder, After a time when the skin had healed on the wound the man became well. The Sunakkhatta sutta of tha same Nikāya (II, 256) contains further instructions of the physician and surgeon in this treatment. According to the physician, though the arrow had extracted and the position drained off, the patient should eat only beneficial foods (sappayani bhojanam) and would take care lest, eating harmful foods, his wound would discharge (vano assava assa). From time to time he should bathe the wound and anoint the opening of the wound (vanamukham aalimpeyyasi) and take care when out of door otherwise the wound would be septic causing ultimately death.

According to the Bhesajjākhandhaka, a physician and surgeon named Ākasagotta was doing surgical operation to ɔaure monk suffering from fistula (bhagandala) which was

forbidden by Buddha for the reason that it was in the concealed part of the body. Jīvaka, however cured fistula of the king Bimbisāra by applying oitment once (Mahāvagga, p. 273).

According to the Śivi Jātaka (vol. IV, pp. 406-7), Jīvaka was a master surgeon, who, by surgical operation took out two eyes of the king and grafted them in the sockets of eyeball of a Brāhmaṇa.

The Milindapañha describes in a few extracts how the surgeons in those days were successful in healing the wounds of the patient by surgical operation by applying medicine, ointment and making cauterisation (P. 112).

Thus the early Pali literature reveal that the medical science was highly developed in ancient India.

ATHARVANIC MEDICINE : ILLUSORY OR GENUINE

SUBRATA BASU

Introduction :

Since the dawn of human civilisation, and the time when man acquired the knowledge of growing his food, he learnt to combat the disease and practised the premitive art of healing for his survival. The ancient history of Greece, China and India provide us with informations regarding the art of medicine practised and its gradual development.

From early times, even before the advent of the Aryans in India in 2nd millennium B.C., knowledge of medicine in India has grown and matured. During its long development it has accumulated the ever renewed experience of India's inhabitants, using the resources of their environment for the purpose of healing. India with its trying climate and regions, is haunted by epidemics and infectious diseases ; and diet formed an important part of medicine, not only for the sick but also for the healthy, Cowherds and hermits hunters and other people living in the wild forest and depending on forest products give evidence of the healthy effect of herbs.

The earliest of Indian medicine, as practised during first and second millennium B.C., are found in the Vedas, specially in Atharvaveda. Atharvaveda means the veda of the Atharvan or the knowledge of Magic Formulas. The Atharva Veda is a collection of seven hundred and thirty one hymns, which contain about six thousand verses, and is devided into twenty books. The purpose of Atharvaveda is "to appease, to bless and to curse". Those numerous magic formulas, however, which contain curses and exorcisms, belong to the province of unholy magic.

System of Medicine in Atharva Veda :

One of the Chief Constituent parts of the Atharva-Veda consists of songs and spells for the Healing of Diseases, which belong to the magic rites of healing (bhaiṣayyāni). They are either addressed to the diseases themselves imagined as personal beings, as demons, or to whole classes of demons who are considered to be the creators of diseases. Some of these spells are also invocations and praises of the curative herb, which is to serve as the cure of the disease, others, again, are prayers to the water to which special healing power is ascribed, or to fire which is looked on as the mightiest scarer of demons. These songs of magic, together with the magic rites attached to them, form the oldest system of Indian medical science.

The Atharva Veda enumerates quite a large variety of diseases and the demons supposed to have caused them. Consumption, scrofula, dycentry, boils, swellings, convulsions, ulcers, rheumatism, headache, Jaundice, cramps, eye diseases, senility, fractures and wounds, bites of snakes and other harmful insects, poison in general, lunacy and leprosy are the diseases mentioned in Atharva Veda. The use of sandbags to stop bleeding is interesting. The practice of dissecting animals at the sacrifice was a great help to the knowledge of anatomy which was developed to an appreciable extent.

The vedic hymnas are phrased against the demons for expelling diseases caused by them or sent by the gods as a punishment for man's sin. The hymns are supplemented by amulets medicines, philters and other devices of witchcraft,

and show a prevalence of the magic element. This magic element of ancient Indian medicine, which persists in some form even today, forms part of its "psychosomatic" approach to the task of healing. India practices both medicine of the body and medicine of the soul. From the Atharva Veda one can say that their knowledge of diseases and treatment of diseases is somewhat primitive and underdeveloped, consisting as it does of the use of herbs in combination with spells and of water.

The efficacy of the drugs is more or less a matter of faith, based an ancient usage and previous experiences, as such methods prevail among shepherds and old women. The Physician may diagnose a patient as being seized by some god or some superhuman being prayers, formulae and offerings, to propitiate the intruder, form part of the treatment, side by side with proper use of occlusive dressings leeches, clyster pipes, various kinds of herbs etc. They represent the psychic approach of archaic psycho-somatic medicine, and are considered the indispensible subsidiary expedients of everyday routine, just as in modern times persuasion, hyphotism and psychoanalaysis are restored to, in an attempt to appease demons in the form of complexes and obsessions. Though the technique of rational treatment gains ascendency in post-vedic times, prayers and incantations, charms and exorcisms, offerings and amulets retain their respected place in classic medicine.

The connection of the Atharvanic medical charms with the later Hindu medicine of classical times (Ayurveda) has never failed to impress itself both upon the Hindus them-

selves who regard the Ayurveda as an upaveda (after veda) of the Atharvan. The diagnosis of fever (takman in AV, Jvara in later medicine), especially of intermitent fever, of wasting pulmonary diseases (Yaksma), and of a considerable number of other diseases is almost the same in both.

The classification of the medical hymns of the AV is difficult for various reasons. The meaning of the names of the diseases is often obscure, a great variety of unrelated diseases are often grouped in the same charm, the line between disease and possession by demons and demoniac influences is not drawn sharply, and the curative influences that are employed are either of the symbolic order, or consist of amulets instead of healing substauces. These amulets are largely derived from the vegetable kingdom, the designation of the plants being again generally quite obscure.

Now the question may arise : do these hymns when chanted by a priest or by the person himself, wants to be cured of a disease, really do miraculous cure of diseases, or there are some other materialistic things behind these which actually do the cure. It is noted earlier that Ancient India practised both medicine of soul and medicine of the body. Diseases, in veda, are looked upon as possession by demoniac personalities, or as visitations by the gods. So for cure of the diseases it requires the propitiation of the relevant demon through a cummulative series of charms. These charms form part of a magic treatment, the treatment of the soul which increases the psychic force to combat disease. At the same time some rituals are performed on the person to be cured like the patient is made to drink certain liquid, body is rubbed with certain colour or herb, an amulet is tied in to

the patient. This definitely acts as the medicine of the body.

The demon disease, to be expelled from the patient's body through the magic rituals of which the hymns from the oral part, is regarded as extremely powerful, since the whole array of the healing powers the vegetables and mineral kingdoms have in store is conjured to fight him off. Accordingly the doctor magician calls upon the herbs and plants, minerals and other medicinal objects to furnish all possible aid. Strictly speaking there are no herbs whatsoever that are destitute of healing power. All these have a specific character, particular virtues of their own, which are manifested in their many forms and may be used in the prevention and healing of diseases, if properly propitiated and harnessed to the physicians efforts. Thus the approach to the healing of the disease is "phycho-somatic."

As the magic, which seems to be guided by supernatural power, can be explained scientifiically, so also the magic art of healing as practised in Ancient India, as enumerated in Atharva Veda, can also be explained scientifically in most of the cases.

Here an attempt has been made to explain scientifically the art of healing contained in the hymns of Atharva veda, which otherwise seem to be vague, primitive, illogical and meaningless.

As Atharva Veda mentions the cures of quite a number of diseases, the present discussions is limited to only one disease Leprosy as described in the hymns I 23 and I 24 ; and also in II 8 and II 25 where it is mentioned while describing other diseases.

HYMNS OF ATHARVAVEDA

For cure of Leprosy with a Healing Plant (Dark)

According to the translation by Maurice Bloomfield,

AV I 23

1. Born by night art thou, O plant, dark, black sable. Do thou, that art rich in colour, stain this leprosy and the gray spots !
2. The leprosy and the gray spots drive away from here may thy native colour settle upon thee-the white spots cause to fly away !
3. Sable is thy hiding place, sable thy dwelling place, sable art thou, O Plant, drive away from here the speckled spots !
4. The leprosy which has originated in the bones, and that which has originated in the body and upon the skin, the white mark begotten of curruption, I have destroyed with my charm,

AV I 24

1. The eagle (Suparna) that was born at first, his gall thou wast, O plant, The Asuri having conquered this (gall) gave it to the trees of their colour.
2. The Asuri was the first to construct this Remedy for leprosy, this destroyer of leprosy. She has destroyed the leprosy, has made the skin of even colour.
3. 'Even colour' is the name of thy mother : (Even Colour) is the name of thy father, thou, o Plant, producest even colour : render this (spot) of even colour !
4. The black (plant) that produces even colour has been fetched out of the earth. Do thou now, pray, perfect this, construct anew the colours.

Commentary of the hymns
AV I 23 and 24

(Based on the commentary of Sayanacharya and translations by William Dwight Whitney and Maurice Bloomfield).

The practices connected with the hymns I 23 and I 24 are defined by the commentators as a cure for white leprosy and gray leprosy.

While reciting I 23, for cure of white leprosy the priest having rubbed dung upon the sores until they are red, smears upon them the substances, mentioned in the mantras. For gray leprosy, he covers the sores and smears upon them the same substances mentioned. Sayanacharya mentioned the substances as Bhringaraga (Eclipta Prastata), Haridra (Yellow turmeric), Indravaruni (Colocynth), and Nilika (Indigo).

Sayana refers the adjectives dark etc., to the plants. The word ragani of stanza 1 has also the meaning 'Curcuma longa' (Yellow turmeric & Haridra). In stanza 3, the plant addressed is Indigo (Nili). The dark plant mentioned in stanza 1 of I 24, was the gall (Pitta, dosha) of the primordial bird suparna (eagle). The Asuri engaged in battle with him, conquered and captured gall. The gall having been conquered took the form of trees i.e. became a healing plant. The commentator regards the healing plant as Indigo (Nili).

While describing the cure of diseases kshetriya (hereditery disease) and Kanva in the hymns II 8 and II 25 respectively, the commentators have mentioned the use of the following vegetable products which were also similarly used in the cure of varieties of leprosy.

(a) Terminalia Arjuna
Bansy Chaff
Seasame panicles

which are bound on the affected limb of the patient.

(b) Prcciparni or Citraparni (Glycine debiles, Hermionitis cordifolia)

The juice of which is squeezed out and applied on the sore.

Before application of the above, the patient is bathed with sacred water.

History of Leprosy

In India leprosy has been described as 'Kushtha' in the vedic writtings about 1400 B.C. A reasonable good description of its clinical features is found in Sushruta Samhita written about 600 B.C. It is said that the laws of Manu dating back as 1309 B.C. also contain instructions with regard to preventive measures against leprosy. However, it should be borne in mind that Kushtha meant skin diseases in general among which leprosy might have been an important and fairly common ailment.

Leprosy is a chronic infectious disease produced by Mycobacterium Leprae characterised by involvement of peripheral nerves resulting in nodular infiltration and anaesthesia of skin, muscular atrophy and tropic ulcers. Since the causative organism has a special predilection for the cooler regions of the body the disease Manifests itself as a surface disease with the lesions mainly in the cutaneous nerves, subcutaneously situated nerve trunks, skin, mucons membrane of the nose and the upper respiratory tract, anterior aspect of the eye, and testes. The lepra bacilli also invade the reticulo-endothelial system producing granulomatous lesions in the liver, spleen, bone marrow and the lymph nodes.

It is a slowly progressive disease with a silent period or incubation period 2 to 5 years. Further leprosy is prone to produce crippling deformities which leaves a permanent mark on the sufferer and therefore a stigma is attached to him.

Medical Management

Until 1947 there was no effective antileprosy drugs. Medical treatmenr of leprosy, much unlike other diseases is long and protracted. Although antileprosy drugs and their effective dosage are well known, the response of the patients to drug is not uniform and their management therefore varies. The success of management to a considerable extent will depend upon a proper understanding of concepts of the classification of clinical types of the diseases.

Since leprosy patients have anaesthesia of the extremities, the physical and mechanical techniques of physiotherapy are to be applied with care and proper knowledge by the therapist. The objectives of physiotherapy are :

1. To prevent deformity
2. To improve blood circulation by
   (a) Wax bath
   (b) Hydrotherapy—in absence of wax bath.
3. To maintain and improve muscle tone and mobility of joints.
4. To assist in correcting deformity by
   a) Splinting
   b) Plastering.

Prior to the discovery of M, Laprae, the management of the disease essentially was restricted to offering symptomatic relief by way of dressing of ulcers, attention to deformities etc.

EFFICACY OF LEPROSY DRUGS OF ATHARVAVEDA

1. Haridra ; (Indian termeric)

It is an East Indian perinnial herb (curcuma longa (with a large aromatic deep yellow rhizome, used as a colouring agent, a condiment, or a stimulant. It also means any of several plants such as the blood root or golden seal, yielding coloured juices and resembles the East Indian turmeric. Its bulbous or tuberous part is from $\frac{1}{2}$ to $1\frac{1}{2}$ inch long and 1/8 to 1/4 inch thick.

Golden seal, otherwise known as Hydrastis canadensis, a small erect herb of the crowfoot family, called also orange root, yellow root, Indian turmeric root, and puccoon. Hydrastis canadeatis is a valuable medicine in Homoeopathic medicine of treatment and is used in skin diseases like Lupus which often resembles to leprosy, ulcers and cancerous formations of the skin. Rubbed down with oil it is applied to any roughness of the skin, with lime to bruishes, sprains, and gastric affections, in small pox and in cold and corza. It acts specially on mucous membrane. It is used externally and also internally. It is similarly used In Allopathic and other schools of medicines.

Blood root, otherwise, known as sanguinaria canadensis is a plant of Poppy family, also called red puccoon, red root, Indian paint, Turmeric etc. Its action on skin and mucous membrane is very similar to that of Hydrastis and is widely used in various modern systems of medicines.

The proven action of Indian turmeric (Haridra) on skin, wounds, and ulcers, resembling that of leprosy, indicates that it has been very rightly used in the days of Atharvaveda as a healing agent against skin lessions, such as leprosy.

2. Indravaruni (Colocynth)

It is a mediterranean and African herbaceous vine, which is related to water melon, of family cucurbitaceae. It is also called as bitter apple, cucumber etc., and is also grown in India, the fruit of which is about 5 cm in dia. The juice of the fruit has been used in traditional medine.

It acts on visceral organs, colon, rectum and nerves, and is extensively used as medicine in diseases like colic, dysentery, sciatica, Neuralgia etc., and as purgative. It is also used in cramps and twitching and shortening of muscles. in constrictions and contractions. When applied on wounds and ulcers, it helps in healing.

Its action on nerves, on wounds and on small muscles Proved to be a great medicine against leprosy in the days of Atharvaveda, in absence of more specific medicines of the modern age. Considering the above facts its efficacy against skin diseases is beyond doutb.

3. Nilika (Indigo, Indigofera tinctoria)

It is a shurb of the pen family, native to India, long cultivated in the orient as a dye plant. It has marked action on the nervous system, and an Indian medicine for Epilepsy. Pure powdered indigo placed on the wound cures lesion caused by snake and spider poison. A politice or plaster of the leaves is recommended in various skin affections and is used as a stimulating application to old ulcers and haemonhoids. Also used in hydrophobis.

Wild Indigo (Baptisia tinctoria) in low dilutions produces a form of antibodies to bacteria (specially salmonella typhosa) and raises the natural body resistance to the invasian of

bacillary intoxication. It also acts on the skin for the cure of ulcers and livid spots all over the body and limbs. It also raises the blood circulation of the body.

The action of indigo on nerves, skin, and mucous membrane has made it an useful drug for leprosy. Its action on blood circulation helps in physiotherapy against deformities.

4. Bhringaraga (Eclipta Prostata)

This is a very common weed in the rainy season, and may be found in irrigated fields and gardens at all time of the year. It is bitter, pungent, hot and dry removing phlegm and wind, increasing the appetite, and curing diseases of skin, eye and head. In practice it is used principally as a tonic and deobstruent in hepatic and sphenic enlargements, and in various chronic skin diseases. In cases of skin diseases it is applied externally and taken internally.

It is also used for dying the hair black, for growth of hair and to prevent falling of hair.

5. Preniparni (Glycine debilis, Hermionites Cordifolia)

The oil of the fruit is rich in protein and makes a very good skin ointment. Applied on sores it helps in healing. As a medicinal ointment it is used in all skin lesions, leprosy being one of them.

6. Terminalia Arjuna
Barley Chaff
Sesame Panicles

Terminalia Arjuna is used as Tonic, astringent, cooling, and in heart disease. Bark has some special virtue in promoting the union of fractures, and the dispersion of

ecchymosis when given internally. Externally it is used in the form of an astringent wash to ulcers. It contains a large proportion of calcium carbonate.

It is most likely that terminalia arjuna was used as splintering material against possible deformity of limbs in leprosy.

Use of husk of barley and panicles of seasons is not known, probably they were used to help in healing of skin lesions.

Bath before application of the above materials possibly represents the hydrotherapy to improve blood circulation to the affected limbs.

In addition to the above, other vegetable matters also may have been used in the cure of leprosy, which did not find place in Atharva Veda. The most important of these is chaulmoogra oil. Chaulmoogra (Taraktogenos Kurzii) bears a fruit which, in size, is about equal to a small orange. Within the hard ring is a sweetish pulp, closely packed with large seeds. From these seeds is obtaind the highly valuable chaulmoogra oil. This oil, which, in the orient, has been long used in the treatment of skin diseases, was formerly the only known means of arresting the course of leprosy. This was extensively used till the discovery of the modern drugs at the middle of this century. It is still being used in leprosy as an external application as well as parenterally.

Other vegetable sources which may have also been used are Hydrocotyle (Indian Pennywort, Thankuni) ; Calotropis Gigantea (Madan bark, Akanda). All these vegetable sources, till recently, have been used in various skin diseases and to combat leprosy.

As leprosy is considered to be a kind of skin disease with extra cutaneous manifestations, in Atharvaveda, the treatment of leprosy is generally the treatment of the skin, and drugs are used accordingly.

Conclusion

It is to be borne in mind that the knowledge of diseases and their successful treatment was still to be developed during the days under consideration. Drugs were used in their crude forms and were not good enough to bring complete cure. Character and course of diseases were much different than what they are now. In absence of scientific and laboratory investigations, the diseases were diagnosed by clinical features only. So there was always a possibility of wrong diagnosis leading to wrong treatment,

The treatment of a disease was a complex procedure, consisting of application of drugs in various forms, performance of religious rites, chanting of mantras (hymns), undergoing expiration etc. No cure was cure unless it was realised through some magico-religious procedure. The diseases were supposed to be caused by some evil beings or due to the sins etc. The ways of curing were also accordingly of pacificatory or expiatory nature. Gods were requested to cure diseases. The medicine man/priest sometimes used their own power or took help of some power—medicinal substances. But in any case there would always be found a mixture of magic and religion.

The cumulative effect of all these i.e. medicine, natural therapy, faith, psychical satisfaction etc. brought some sort of magical and miraculous cure complete or partial. It was

the medicine which took active role, and the magic, various religious rites, mantras etc. took the passive role in the cure of disease.

Thus it can be concluded that the mode of treatment of diseases as described in Atharva Veda, though primitive and full of magical art in the form of various religious rituals ; the various herbs used, acted as medicinal agent and brought some cure or Atharvanic medicine is thus beyond any doubt.

Sources :

1. Hymns of Atharvaveda—
   Mourice Bloomfield.
2. The Athervaveda and the Gopath Brahmana—
   Maurice Bloomfield.
3. Atharvaveda Samhita Vol. I—
   William Dwight Whitney.
4. Atharvaveda Samhita (In Bengali)—
   Bijan Behari Goswami.
5. History and Culture of India People Vol. I—
   Gen. Editor, R. C. Majumdar.
6. History of Indian Literature Vol. I—
   M. Winternitz, (Trans : S. Ketkar).
7. Hindu Medicine—
   Henry R. Zimmer.
8. Medicine : Its magico-religious aspect—
   G. U. Thite.
9. The Encylopedia of world knowledge Vol. 2—
   Editor in Chief, William J. Redding.

10. Davidson's Principles and Practices of Medicine—
Editor : John Macleod.

11. Homœopathic Matheria Medica—
William Boericke.

12. Quarterly Medical Review : Leprosy—
Raptakos, Brett & Co.—Bombay.

13. Leprosy—Diagnosis and Management—
C. K. Job and others.

14. Studies in Medicine of Ancient India—
A. F. R. Hoerule.

15. Classical Doctrine of Indian Medine—
J. Filliozat.

16. Pharmacographia Indica Vol. 1, 2 & 3—
William Dymock.

Navanītaka—An Āyurvedic text in Central Asia

Dr. Kshanika Saha

Āyurveda means the "Knowledge of a long life" and it is exceedingly importaant in the history of science. It is a key concept of Indian medicine and it roughly means a rational application. Rational application or Yukti is che ultimate foundation of therapeutic success. Intellectual discipline and rational application constitute Ayurveda. Prof. R. C. Majumdar writes "There is a remarkable theory in Āyurveda to the effect that man is the epitome of the universe, a 'microcosm' of the macrocosm'. Both the universe and man are manifestation of one and the same eternal spirit. The concept of the microcosm follows the philosophical doctrines of the Sāṁkhya and Vedānta schools of Indian philosophy. The basic common concepts of Indian philosophy have also been largely incorporated into Āyurveda. Āyurveda acceipts that the highest aim of life is the quest for ultimate truth and realisation ; that the perception of our senses is not valid in the absence of spiritual insight ; that suffering is due to the human error of discrimination between the body and mind which suffer and the spirit which immune. The supreme essence of power and awareness is present in man, making him potentially omniscient and omnipotent when he achieves self-realisation and salvation, a healthy body, long life and keen mind being desirable aids to this end. The Indian tradition speaks of three major source books of Āyurveda. These are Caraka Saṁhitā, Śuśruta Saṁhitā and Aṣṭānga Saṁgraha. Besides these we are in possession fragmentary medical works like Bower manuscript and Bheda Saṁhitā.

The Ayurvedic text "Navaniṭaka" is named after its discoverer Lieutenant Bower as Bower manuscripts. Early in the year 1890 he discovered it in Kucha. He went there on a confidential mission from the Government of India. On his return to India Bower took the manuscript to Simla in September, 1890, he forwarded it to Colonel J. Waterhouse who was then the President of the Asiatic Society of Bengal. By him it was exhibited to the Society at its monthly meeting on the 5th November, 1890. The whole story of the discovery and decipherment of the Bower manuscript was narrated by Sir Alfred Croff in his Presidential address in 1894. It was the discovery of the manuscript and its publication in Calcutta which started the whole modern movement of the archeaologieal exploration of Eastern Turkestan. In the meantime the publication of the Bower manuscript steadily pursued its course. The proposal to prepare a complete edition of its text, illustrated with facsimile plates and accompanied by annotated English translation was made in 1892. Subsequent finds of ancient Central Asian manuscripts and the Sanskrit Index were published in 1908 and a revised translation of its medical portions appeared in parts I, II and III in 1909.

The external form of the collective Bower manuscript is that of an "Pothi". The leaves of the Bower manuscript are cut from the bark of the birch tree. The Indian Pothi of the birch bark Bower manuscript is a corroborative evidence of the great antiquity of the manuscript. The language of the text is a 'mixed Sanskrit' i.e., Sanskrit mixed with Prākrit which was the accepted medium of the early Mahāyanic writers. The lower limit for the date of

Navanītaka may be placed provisionally in the beginning of the fourth century A.D. or about 3rd century A.D. The upper limit is determined by the circumstance that the Caraka Saṁhitā and Suśruta Saṁhitā are two of the sources from which the author of the Navanītaka quotes copious extracts. The Bower manuscript is a collection of fragments of different manuscripts dealing with medicine, treatment of diseases along with Mahāmāyuri Vidyārañji the wellknown tāntric treatise of charms and spells for curing snake bites. These fragments were edited by Hoernle in seven parts. The second part of the earlier medical literature. In the opening verse of Navanītake the author states that he was putting together the best known formulae of the medical authorities of his time. He incidetally mentions the earliest famous medical teacher as Punarvasu, son of Atri commonly known rs Ātreya. According to the Indian tradition he was a physician teaching medicine in Taxila in North West India about the time of Buddha in the 6th century B.C. He is said to have had six disciples to committed their masterly teaching to writing in Tantras, larger treatises or Kalpas and gather their substance into Saṁhitās. Only two of these Saṁhitās have come down to us. These are the Caraka Saṁhitā and the Bheda Saṁhitā. The compendium known as Caraka Saṁhita which professes to give Ātreya's teaching as reported by his pupil Agnisena was compiled by a physician of Kashmir called Caraka. The author of the Saṁhitā is not known. Both these Saṁhitās or compendium must have been wellknown standard books in time of the Navanītaka for he makes copious extracts from them without naming them as his sources. From the Bheda Samhita the following formulae are taken.

(1) Ayorjiya-churna vv. 48-55 ;
(2) Rasayanika-ghrta
(3) Dasanga ghrta
(4) Madhuyastika taila
(5) Karnasulayaga

From the Caraka Samhita the following formulae are taken.

(1) Talisaka churna
(2) Vardhamanaka churna
(3) Tktaka ghrta
(4) Shatpata ghrta
(5) Chyavanaprasa

Besides these formulae comprised in the foregoing two lists, the Navanitake contains a considerable number of other formulae the authors of which are not indicated and the source of which is impossible to identify.

Contents of the Bower manuscripts of medicine

In the first part of the Bower manuscript are found miscellaneous topics such as a tract on garlic and stray remarks on the regulation of digestion and a few formula on eye-lotion and face plaster. The author says that garlic is able to cure many diseases and extend the life upto 100 years. It cures black leprosy, loss of apetite, tumuor, cough, weak digestion,urinary disorders and cold in the head. Thus for the administration of garlic has been explained even as it was taught by the old sages and one should āccurately observe it. Food, digestion, energy and long life are all dependent on the digestive faculty. When t he digestion is abnormal or irregular, one should drink "Dadhika". When the digestion is weak, one should fast at first and

afterwards use medicine to promote apetite and assist digestion in wek or too active a person dies unless he receives a proper treatment. When it is regular, he lives long in comfort. Hence a wise physician will at all times in all diseases first direct his treatment to the proper regulation of the digestive faculty afterwards paying attention to the relief of the sickness.

He who desires a good memory, health and strength and wishes for a long life should make use of the fresh juice of and There is a course of preparation of Chyavanaprasa. It is a remedy for cough and asthma and it is especially said to promote the growth of the body in the emaciated ulcerated the old and the young. It also cures loss of voice, diseases of the chest and of the heart, disorders connected with the urine.

Besides this there are many preparation of Avurvedic medicines just an oil for the cure of 'Nervous Diseases'. Here is given an example of this. "Take five prasthas of the juice of the radishes, curds also three kudava of sukra, four palas of rocksalt and eight fresh ginger but if fresh ginger is not available, let it be sixteen palas of dry ginger. This preparation relieves sciatica, acute gout also all diseases of the hips and nervous diseases. Besides this there are many preparation of Ayurvedic medicines such as chyavanaprasa, vindu clarified butter, an oil for antifebrile exema (an insertion of liquid into the rectum through the anus by means of a syringe).

The second part of the Bower manuscript called Navanitake. In the opening stanzas the author states "I shall compile a standard manual by the name of Navanitake

containing the foremost formulae of the Maharsis. The first chapter will give formulas for powders, the second chapter various kinds of medicated or clarified butter and the third chapter medicated oils the fourth will be a miscellaneous chapter giving formulas for the treatment of various diseases, the fifth and sixth give formulas for anaemea followed by one with directions for tonics. The 7th will deal with gruels, 8th, 9th and 10th with hair washes, the 11th, 12th, 13th and 14th with the treatment of children, 15th with the treatment of barren womau and the 16th with the treatment of women who are bleased with children. These sixteen chapters constitute the Navanitaka.

In the third there are a few specimens of preseriptions one of which is given by way of illustration :

"Take one karsha each well-powdered plumbago-root, vrhati, haritake, ginger, sulphate of iron and add one kudava of the milky juice of Arka". With all these mix one prastha of oil in four times as much of water and cow's urine. This is a remedy in case of ringworm, tumour and skin diseases also in case of fistula sores, poisoned wounds and enlargement of the lymphatic glands.

Besides the medical texts in Sanskrit original there are evidences to show that the Indian medical literature was widely used in Central Asia because it was translated into Khotanese language. The Khotanese text was edited and translated by Sten Konow. Here is given an example of "Talisapattra, black pepper—pippali 4 mecanga, ginger 3 macanga suskamela 1 macanga each sugar 1 sera, this should be firmly pounded. This curna overcomes cough, respiratory troubles, beats down fever, slow digestion. This curna also overcomes atisara, overcomes areas and vomiting.

—o—

Unani-Tibbi and Ayurveda are Complimentary

Dr. Asoke K. Bagchi

Man developed medicine as a great necessity for saving tnemselves from various illnesses. The origin was multicentric. Man came to know many pharmacological sources by observing wild animals, who were self healers. Many drugs were adopted by him and the specific uses were selected and repeated.

From olden times the surgical process of Trephining of the skull took place at various centres in the earth like France, Spain, Canary Islands, South America and India. Most of the trephined specimens which we have acquired, are from the stone age. The instruments were made of stone which were curved out of hard stones. Many trephined skulls have been found which had been operated on more than one occasion !

The Indian contribution to the science of medicine is colossal. The Indian medical texts are rich and varied. The knowledge and the symptomatic classification used to be adopted by the contemporary as well as modern medical men.

Susruta was our leading surgeon (ca 600 B.C.) who performed abdominal sections, bladder stone-cutting and plastic repair. In the 19th century a surgen of West India developed the Indian Rhinoplasty, which was sound

physiological and rational. It is still in vogue in the terminal decade of our century for reconstructing severed noses.

When Buddhism spreaded into Brahminical India (5th to 4th B.C.) the care for sick persons, hospitals, homes for sickmen and ayurvedic pharmacies multiplied.

The Ionian-Greek, Hippocratas, who was born in Cos, a small island, off the shore of the mainland of Turkey and had his medical education at Cnidia also in Asia Minor. (ca 4th cent, B.C.). One is perfectly right to say that he, was an Asiatic by birth and Asiatic by education ! The pre-christian greeks had fairly close contact with Indian raconteurs and the mercenary Kandahari horsemen who later came to be known in Greece as the Centaur. Mythologically old greek medical science still regards that a centaur named Chiron was first trained in surgery by Aesculapius, the Greek god of Surgery.

In going through history, one finds other such narrations, which very few of us has tried to verify or authenticate.

The Ionic-greeks used to come to Syria, Assyria and other northernly places of the Arabic peninsula and spread their knowledge. The Nestorian Christians used to come to Gundishahpur in West Persia, which become a great city for transaction of East-West kdowledges. After Hipyocrates there was another Ionian-Greek name Galen of Pergamun, who was taken to be a great doctor. Some of his vascular concepts are now discarded because of inaccuracy.

The Indians traveled to Gundishahpur and further west to Mecca, Medina and the Hasemite Kingdom. Through North Syria and Turkey they went to the Greek mainland and had exchanges of knowledge. So, Greek and Indian medicines were aquainted long before their association with the Arabic or Tibi medicine, in the Christian times.

Arabia was a desolate country, mostly having long stretches of barren deserts. Barring a few human settlements, most of Arabs were, nomadic people called the *Bedu* or *Bed*. They were good horsemen and made their tents out of horse hide. The Romans called them Saracens (*Sarakions*-means, living in the tent) because of their tent living. They were people of no medical knowledge, excepting the self understood health measures, some sort of quarintines sparse but nourishing food and living in the open air close to the nature.

Hazrat Mohammed was born in Mecca in 571 AD. He is the greatest personality ever born in Arabia. He created and preached the Islamic region and gradually made many nomads to live in human settlements. He perceived all the deficiencies the Arabs had and tried his utmost to rectify them. Two hundred years latter in 8th Century AD, the Arabs continued with perseverance and attention for many years to master the scientific attainments of nations like Greece, Egypt, Persia and India. important Arab centres were at Baghdad in Mesopotamia and at the Arab occupied areas in Southern Spain, the Muslim Europe or Andalusia.

They collected the medical works of Inoic-Greeks, the Indians and other nations and got all the texts translated into Arabic with the help of scholars.

As they become richer and richer in knowledge, they made their original observations, investigations in many sciences including medicine. Their sincere endeavours led to the preservation of old Indian medicine, Ayurveda, even to-day at the end of the twentieth century ! The initial Arabic or Tibbi medicine later came to be known simply as Unani (Ianian) in Arabia.

The greeks and Indians both were deficient in precise knowledge of human anatomy, as dissections were not permitted in both the countries, however the Indian anatomical concept was richer because of the Indian observations made on putrifying human corpses in shallow flowing rivers. The Arabs understood the importance of dissection so, ibn Masawayh a Christian-Arab started to dissect baboons obtained from Nubia in the upper Nile valley. Gradually, they developed better knowledge of human anatomy.

From the Ionians they collected the knowledge of clinical methods and many principles like the "Four Principles" of Hippocrates. It is naturally understood that, the Greeks had acquired previous knowledge of Tridosa from Ayurveda ! The greek methods of medical teaching were at par with the Ayurvedic system. The Indian medical students had to live with the preceptor under restricted conditions of life and purity, and had to stay there till the end of instruments.

The greatest Arabic enrichment was done in pharmacology, Indian drugs were freely included in their pharmacopia. Even in the Quran Shariff one finds *Kafura* or Karpoor and *Zingiberis* or Sringavera (Ā dā). A Christan-Arab Schollar called Abdul Hasan Ali bin Sahl Rabban al-Tabari or simply al-Tabari was born in Tabristan who made an extensive study of Indian medicine and wrote a noted treatise known as *Firdaus al Hikmat* or *Paradise.* In the book he made a threadbare analysis and description of Indian medicine, the book is always followed by the Unanis.

The greatest uplift to Indian medicine was given during the reign of Caliph Harun-al-Rashid at Baghdad. At his invitation scholars like, *Manikya* (Manka), *Danapati* (Ibn Dhan), *Sali* (Salih), *Kanakayana* (Kanka), *Sandilya* (Sanjhal), *Chanakya* (Shaunaq) and *Jasodhar* (Jaudhar) went to Baghdad. Besides them there were the Barmecids born from the Buddhist Pramukhas. With the help of Indian Scholars *Susrata Samitā* was translated as *Susrad, Charak Samhitā* as *Charak Nidānasthāna* as *Nidān Astāngahrydaya* as *Astānkar.*

The knowledges acheived from Indians through the learned men, and their writings were translated into Arabic and was absorbed into Unani. The already enriched Unani by Indian and Ionian medicine coalesced and become a very rich source of knowledge. That medicine was transported through north Africa to Spain. Where the Moors enriched it further and latinized the texts which went into South of France, North of Italy and back to

Greece. So a cycle was created begining with Indian Persia-Arabia-Spain-Italy and Greece.

It would not be out of place if said that, Moorish medicine very much enriched the European medicine. In the 15th century, Vasco-da-Gama found the sea route to India and finally Goa became a Portuguese encave. Many Physicians and surgeons came to Goa from Portugal and established the first European hospital and Medical College and planted the root of European Medicine on Indian soil.

So all the affairs became some what like, *"Carrying coal to New Castle"*. The Indian and Unani medicines are complimentary.

Early Indian Society : Medical Education and Medical Profession

Dr. Amitabha Bhattacharyya

History of medical science in India can be traced back from the days of the Harappans who are known to have developed an advanced knowledge of surgery. Although there is reference in the *Rig-Veda* to a leech whose son was a bard and wife a basket-maker, growth of medical science in its rudimentary form can be discerned only from the *Atharv-āṅgirasaḥ* which mentions appropriate herbs as remedies against various diseases and incorporates charms fetching healing and happiness. Subjects of study, enumerated in the Brāhmaṇas, do not include medical science. The Chhāndogya and *Śatapatha* Brahmanas[2], however, refer to *Sarpa-vidyā*, i.e., treatises on venoms. It was a well-developed science and a section of it was required to be recited.

Ancient Indian medical tradition grew around three illustrious figures—Jīvaka, Charaka and Suśruta. The first was a medical practitioner in the sixth century B. C. Buddhist texts refer to his ignominious birth and to his magical performance in surgery and with medicine Charaka redacted the treatise of Agniveśa. The *Charaka-Samhitā*, redacted by Nāgārjuna, is a text on surgery.

Neither the Charaka nor the Suśruta has come down to us in its original form. The extant text of the *Charaka-Samhitā* was revised and enlarged by one Dridhabala of Kashmir in the ninth century A.D. The text of Suśruta, once reducted by Nāgārjuna, is also known to have been revised by one Chandraṭa. The Bower Manuscript, assignable to the fourth century A. D. on palaeographical grounds, bears a few tracts on medicine and refers to a number of earlier authorities like Ātreya, Ksharapāni, Jātukarna, Parāśara, Bhedo, Hārita and Suśruta.[3]

In the eleventh century A. D. al Beruni wrote, "medicine belongs to the same classes of sciences as astronomy, but there is the difference, that the latter stands in close relation to the religion of the HIndus"[4], indicating existing of medical science as a branch of knowledge independent of religion. Long ago Susruta laid emphasis on the performance of a separate Upanayana for a student seeking admission to the discipline of medical education, although such a student as a twice-born (Brāhmana, Kshatriya and Vaisya) had already undergone the ceremony in accordance with the rules of his order[5]. A Sudra also, according to some authorities, could have been considered for admission provided he had qualified himself by purity of lineage and possession of virtues. Initiation to medical science was thus not reserved for the higher castes. It was open to all. The candidate, irrespective of his caste, however, had to undergo a screening. According to Susruta, the prospective candidate was expected to posses certain

physical and moral qualifications like courage, good manners, purity of body, mind and speech, and endurance to pain. A candidate lacking these requisite qualifications was not considered for admission[6].

According to theoreticians of ancient India, medical education has two wings, viz., *Sāstra* (Theory) and *Karma* (Practice). A student of medicine must be adept in both. The point has been elaborated by drawing the analogy of a chariot running on a pair of wheels. A physician conversant with the texts only and inefficient in practical application of textual knowledge, gets easily puzzled by the sight of the ailing patient. A quack, on the other hand having no knowledge of the basis of medical science should be ensured and punished. A physician then must be well-grounded in the medical texts, skillful in surgical operations and application of medicine. Proficiency in allied branches of knowledge *(bahu-struta)*, a feather touch and swift hand in surgical operation *(laghu-hasta)*, cleanliness, cheerful disposition, devotion to truth, adherence to medical ethics and professional experience enumerated as indispensible pre-requisites for an aspirant physician[7]. *The Brihat Samhitā,* however, indicates specialisation in different branches of medical science. In addition to such generic terms as *Vaidya Āyushyajña* and *Bhiṣhak* for a physician, we have reference to Śalyahrit (surgeon), Rasāyana-Kuśala (chemist) and Vishaghātaka (depoisoners)[8]. It appears that the older concept of an omni-physician had died out by the time of composition of the text of Varāhamihira.

In the seventh century A.D. I-tsing referred to eight sections of medical science which, according to him, had originally existed in eight separate books. "Lately a man epitomized them into one bundle". I tsing also records that "physicians in five parts of India practise according to this book" and that any physician who is well versed in it never fails to live by the official pay".[9] I-tsing here evidently alludes to either the *Ashtānga-Saṁgraha* or the *Ashtāṅgahridaya-Saṁhitā* attributed to Briddha Vāgbhaṭa and Vāgbhaṭa respectively. Either of these texts had sprung into existence by the seventh century A.D. as a new one on materia medica and had ousted even the *Suśruta* in terms of popularity.

I-tsing, however, refers to medical science as a compulsory course of elementary studies for all. Even those aspiring for monkhood had to take lessons on medical science.[10] Educational institutions in which medical science was included within the curricula were not many in number. We know that Takshaśilā where Jīvaka received training, was an important centre. Hsüan-tsang refers to medical science as one of the subjects taught at Nalanda". It is possible that students specialised in this branch of knowledge in some other important centres of Buddhist education. Inscriptions of the early medieval period, however, seldom refer to medical science as being taught in the Vaishnava and Śaiva *maṭhas* or colleges, although to each of them were attached hospitals and physicians. Even the *Kuvalayamālā* written by Udyotana Suri in A.D. 779, referring to a

number of subjects of the faculties of science and humanities, and to those concerning vocational training, taught at the matha of Vijayapura, does not refer to medicine : The allied subjects of chemistry and alchemy are, no doubt, mentioned by Udyotana.[12] An inscription of the reign of Vikrama Chola (A. D. 1118-35), however, refers ro donation of land for maintenance of a feeding house, possibly an annexe of a *maṭha* meant for students of medicine, grammar and other subjects as well as for Brāhmanas and ascetics.[13]

Medical practitioners of ancient India had certain social commitments. At the completion of education the preceptor advised his disciples to treat without charging fee and cost of medicine the following persons : dvija, guru, pauper, friend, ascetic, protege, saint, orphan and guest. At the same time it is inhuman that the teacher asks his student not to attend a patient who is a sinner, or a hunter and a forester.[14] Stories about physicians amassing great wealth by his profession are not rare.[15] Nevertheless, Charaka states, whatever store of wealth or patronage the physician is able to secure from his association with kings and wealthy persons with a view to ensuring himself an easy and comfortable life, or whatever relief from distress he himself is able to extend to those who have sought for his protection—all this constitutes the wealth of his life".[16]

Kautilya speaks of a standard code to be followed by medical practitioners in the interest of public health and that of patients. He enjoins that heedlessness on the

part of a physician is a punishable offence. The physician will be held responsible for the death of a patient if his negligence is proved after investigation. It was the duty of the attending physician to report to the government all the cases of fatal diseases that he would be called upon to treat. Any attempt flouting this directive was considered as a criminal offence.[17]

The success of the physician, however, depended upon several factors like efficiency of attending nurses *(parichāraka)*, quality of medicines and above all cooperation from the ailing patient. The nurse should be sympathetic *(sneha-yukta)*, skilled in keeping up the patient *(vyadhita-rakshanam)* and implementing the prescription of the physician. The quality of medicine depends upon the raw material, measurement of the compounds and other pharmaceutical accomplishments. The principal subject is the patient He should be faithful to the physician and obedient to the directions.[18] In fact the *Brahmavaivartra-Purāna* clearly states that a physician possesses the knowledge of diagnosis and redressal of ailment of the patient, but he cannot increase the life span.[19]

Epigraphs of the proto medieval period refer to a number of educational institutions of residential type styled *mathas*. To each of them were attached physician enjoining plots of land. Ārogya-śālās or hospitals were constructed for treatment of patients.[20] It is presumable that some of them were open to all and some were meant exclusively for residents of the respective institutions.

An inscription dated A. D. 1062 records gift for establishing a college, a hostel and a hospital called Vira-solan. The hospital was provided with fifteen beds, two servants for fetching drugs, two nurses and one servant for the whole establishment.[21] A Nepalese inscription dated in the year 526 refers to gosthikas who were in charge of hospitals.[22]

The terms used for a physician literary and epigraphic sources are *chikitsaka, bhishak* and *vaidya*. The Jātakas refer to Vejja-Brahmana, i. e., Brāhmana physician.[23] The *Desabrāhmana Jātaka* mentions ten classes of Brāhmanas including those provided with sacks filled with roots. They gathered herbs and muttered aphorisms. Although medical science had developed, the common people believed that malefactions of haunting goblins and evil spirits were at work behind diseases and outbreak of epidemics. Performance of sacrifices and uttering of charms brought relief from maladies. These works, however, were prerogatives monopolised by the Brahmanas. Thus, at least at one stage, medical profession was a matter with the Brāhmanas.[24] It is relevant to note that the term *ojhā*, used in rural Bengal to denote an expert in treatment of snake-bite and warding of evil spirits, is the corrupt from of Sanskrit *upādhyāy* meaning a Brāhmana teacher. The Jatakas bear reference to *vejjas, vejja-kula* and *visa-vejja-kula* (i. e. *visha-vaidya-kula*). Pursuance of medical profession hereditarily led to the emergence of a new class called the vaidya.

Manu attributes medical profession to the Ambashthas mentioned as a mixed caste.[25] They are, however, mentioned in the *Mahābhārata* along with the Śibis, Kshudrakas, and other tribes of the Punjab Valley.[26] They have been identified with the Sambastal or Abastanol mentioned by the annalists of Alexander's invasion From textual references it appears that like the Śibis Mālavas the Ambashthas also migrated from their original habitat and dispersed to different parts of this country They gave up their earlier profession and preferred to live as priests, farmers and physicians.

In the *Bṛihaddharma-Purāṇa* the Ambashṭhas have been mentioned as *uttama-saṅkaras* second only to the Karanaś. They were to study the Ayurveda and take to the profession of a physician. Hence they were called Vaidyas.[27] It is stated that they were to follow the vacation of a Vaiśya in respect of preparing medicine and that of a Śudra in respect of religious ceremonies. The *Uśanas Smriti* refers to Bhishak as born of the union between a Brahmana male and a Kshatriya female. The Bhishak in this text is styled Vaidyakas. The Ambashthas are, however, distinguished from the Vaidyakas in both the *Brahmavaivartta-Purana* and the *Uśanas Smiti.*

Existence of Vaidyas as a distinct class or social group is not vouchsafed by epigraphic sources. Reference has been made to three inscriptions from South India dated in the eighth century A. D. They mention three members of Vaidya families who held very high position in the state. One of them was a great general and the prime

minister. He is described as the crest-Jewel of the Vaidyakas. The second was a feudal chief who glorified the Vaidya families. The third, called simply a vaidyaka, was a great scholar, poet and an operator.[28] Reference to Vaidyakula has been taken to indicate existense of a social group whose members were called Vaidyas.[29] They did not, however, confine themselves to medical profession. D. C. Sircar refers to the Vaidya-Ambashṭhas of South India and the vaidya-paṇḍitas of Orissa. They do not take to medical profession exclusively. Prof. Sircar thinks that large scale migration and settlement of the Ambashṭha-Vaidyas from the south and their blending with the medical practitioners of Bengal led to the development of the Vaidyas as a distinct group in the social demography.[30]

That the Vaidyas of Bengal did not form a distinct Jati before the thirteenth century seems to be evident from their reference in epigraphic and literary documents, The Paschimbanga copper plate of the reign of Śrīchandra (C. A. D. 925-75) mentions that Vaidyas were or physicians were employed for the two sets of *maṭhas* meant for the vaṅgālas and the Deśāntarīyas.[31] Sureśvara, the author or Śabda-pradīpa, introduces himself as born in a Karaṇa family and as the physician to king Bhīmapala. His father and great grandfather were also physicians who served under Rāmapala and Govindachandra respectively.[32] Vanamālikara, the minister of Iśāṇadeva (c. A. D. 1250-50), mentioned in the Bhatera inscription, has been referred to as a 'lamp to the Vaidya race'. The cumulative evidence

indicates the Vaidyas did not exist as a separate social group in Bengal before the commencement of the thirteenth century.[33]

It appears that medical profession in ancient India comprised pharmaceutics, quackery and sorcery. The situation is probably hinted at by the observation of Megasthenes quoted by Strabo. Megasthenes refers to physicians bringing relief to patients by application of oinments and plasters. There were others who used to "effect cures rather by regulating diet than by the use of medicine". The third group comprised "diviners and sorcerers".[34] In the Jātaka stories all of them are mentioned as *vejja (vaidya)*. Medical profession has been stigmatised in Brahmanical texts. Manu asslgns it to a class of a comparatively lower origin. Brāhmaṇas were forbidden from collecting medicinal herbs as well as from receiving food offered by a physician. Whatever might have been the outlook of the Brahmanical social thinkers, medical practitioners enjoyed quite and a respectable position at least in the official hierarchs of the state. Kauṭilya refers to physicians who had to accompany the army to the battle field with medicines and surgical instruments belonging to the salary-group of two thousand paṇas. It is placed next to the four thousand-paṇa group to which belonged the superintendents in charge of infantry, cavalry, chariots and elephants respectively. There were at least six more salary groups which followed the two thousand pana group. [35] The high position held by three persons of Vaidya-kula in the Pandyan kingdom

in the eighth century A. D. is attested to by epigraphic documents.[36] In eastern India the Paschimbhag copper plate seems to thrw light on the position of physicians in the social gradation. It refers to the foundation of four Vaṅgāla and four Deśāntarīya maṭhas (i. e. maṭhas meant for students of Vaṅgāla and those meant for students of countries other than Vaṅgāla) and records donation of a total of 280 *pāṭkas* of land in favour of the teachers, students, scribes, accountants, astrologers, physicians *(vaidya)* and others attached to the two sets of maṭhas. Details of the distribution indicates that eight teachers received ten *pāṭakas* each, two mahattara br hmaṇas received two *pāṭakas* each, the scribes got two-and half *pāṭakas* each while the two physicians enjoyed three pāṭakas each.[37] If the area-measure of land donated be regarded as an index to the status of the receiplants, then the physicians should be placed only next to the teachers of the four Vedas. The concept of an ideal physician, reflected in the *Brahma-vaivartta-Purāna* reveals the high esteem in which he was held. It is state, 'he alone should be revered as a physician who knows the medical science has expertise in medical treatment, who is truthful to his profession and is merciful'.[38]

Development of medical education and medical science created new prospects of livelhood and fostered trade. In Rock Edict 11 Asoka claims that everywhere in the bordering and neighbonring kingdoms medical treatment for men and for cattle has been established. Wherever there were no herbs that were beneficial to men

and beneficial to cattle, everywhere they were caused to be imported and to be planted.[39] In the *Mahāvastu Avadāna*, mula-vanijas are enumerated among the various professions.[40] They were cealers in plant roots, presumably those which were used in medicine. An inscription from Nepal refers to gathering of medicinal plants which was exempt from taxation.

A large number of herbal and mineral substances animal products have been referred to in the *Charaka* and *Suśruta* which were used in medicine. A few of them were of extra-Indian origin. Mention may be made of *turushka* identified with liquid storax or sap of liquiadamber orientails. It was procured from south-western Asia. The *Periplous* bears reference to export of storax from Cana (Hisn Gnorab). It was imported to the ports of Barygaza and Scythia.[41] The Susruta refers to kustha (costus), patra (cassia cinnamon), manahslila (red arsenic sulphide) and sisana (lead). According to the Peroplous they were rugularly exported from India. Pliny refers to their demand in the Roman empire for medicinal purposes.[42]

Reference and Notes

1. *RV*, IX. 112, 1.
2. *Śatapatha Brāhmaṇa*, xiii, 4, 3. 9. Sarpa-vidyā, according to the commentator on the *Āśvalāyana Śrauta Sūtra* (x, 7.5). denoted the Kāśyapiya and other treatises on venoms.
3. The *Milinda-Pañha* refers to Nārada, Dhammantari, Āṅgirasa, Kapila, Kandaraggisama, Atula and Pubba Kachchāyana as old teachers of medical science. (iv, 7, 20).
4. E. C. Sachau, *Alberuni's India*, Indian reprint, Delhi, 1964, pp. 158-59.

5. *Suśruta-Saṁhita*, II.
6. *Ibid.*
7. *Sūtra-sthāna*, iii-iv, 16-21.
8. *Brihat-Saṁhitā*, V, 41 ; X, 3 ; XV, 26 ; V, 80 ; XVI, 19 ; LXXXV, 32.
9. *A Record of the Buddhist Religion as Practised in India and the Malay Archipelago* (trans. J. Takakusu), Oxford, 1896, pp. 128 ff.
10. *Ibid.*, p. 130.
11. Watters, *On Yuan Chwang's Travels in India*, Vol. I, p. 158.
12. A. N. Upadhye (ed.), *Kuvalayamālā*, Bombay, 1959, p. 150.
13. *Annual Report of South Indian Epigraphy*, 159 of 1925.
14. *Ashṭāṅga-hṛidaya, ūtr-sthāna*, II.
15. The *Ma¯avagga* (VIII, 13) refers to 16,000 kahāpanas and a servan and a maid-servant which Jivaka earned as fee by curing a patient. The same text (VIII, 20) refers to 100,000 kahapanas which Jivaka charged for curing the chief setthi of Rajagaha.
16. *Sūtra-sthāna*, 30, 29(3).
17. *Arthaśāstra*, II, 26, IV, 1.
18. *Sūtra-sthāna*, IV.
19. *Brahmavaivartta-Purāna*, XVI, 25.
20. R. K. Mookerji, *Local Govenment in Ancient India*, 2nd. edn., 1958 (reprint), Delhi, pp. 475-76. See also our article on the Maṭhas of Eastern India in the Early Medieval Pe.iod, *Journal of Ancient Indian History*, Vol. XVII, pp. 164-78
21. *Annual Report of South Indian Epigraphy*, no. 182 of 1915.
22. D. R. Regmi, *Inscriptions of Ancient Nepal* vol. I, New Delhi, 1983, no. LXV. See also Alakananda Bhattacharyya, *Nepalese Inscriptions in Pre-Newari Erea- An Annotated Bibliography*, Calcutta, 1994, p. 36.
23. Fausboll, *The Jātakas*, II, 213.
24. R. Fick, *The Social Organization in North-East India in Buddha's Time* (trans. by S. K. Maitra), Calcutta, 1920, pp. 236-37.
25. *Manu*, X, 8, 47.
26. *Mahābharata*, II, 52. 14-15.
27. *Bṛihaddharma-Purāna*, II, chap. xiii. See also R. C. Majumdar (ed), *The History of Bengal*, vol. I, Dacca, 1963 (reprint), pp. 589-90.

28. *Epigraphia Indica*, vol. xvii, pp. 291-309 ; vol. viii, pp. 317-21 ; *Indian Antiquary*, vol. iii, pp. 57 ff
29. R. C. Majumdar, *op cit* p. 590.
30. D. C. Sircar, *Pāl-Sen Yuger Bamśānucharita*, Calcutta, 1982, pp. 165 70.
31. D. C Sircar, *Epigraphic Discoveries in East Pakistan*. Calcutta, 1973, pp 67-68.
32. R. C. Majumdar, *op. cit*. pr 585.
33. *Ibid* , p. 590.
34. *Strabo*, XV, i, 60.
35. B. C. Sen, *Economics in Kauṭilya*, Calcutta, 1967, p. 104.
36. See n. 28.
37. D. C. Sircar, *op. cit* , pp. 67-68. It may be noted that the inscription does not refer to the physician in connexion with the Brahma-maṭha.
38. Hultzsch, *CII*, I, pp 2-3.
40. R. G. Basak, *Mahāvastu-Avadāna*, vol. I, Calcutta, 1963, Introduction, p. xxxviii.
41. *Periplus*, 39.
42. *Pliny*, xii, 25, 41. See also B. N. Mukherjee, *Rise and Fall of the Kushana Empire*, Calcutta 1988, p. 587.

Philosophical Basis of Development of Ancient Indian Medicine

Dr. Plaban Mukherjee
MS, MCh.
Registrar
Cardiothoracic Surgery Unit
Calcutta National Medical College

The archaic usage of the English word "Physic" as the name of the art, practise and profession of what is now generally called "Medicine" suggests what the word's Greek root signifies, namely, that the physician no less than the physicist is a student of nature. When we look back at our heritage, we find acient India not only believed in natura therapy but went deeper in the matter where man, mind and medicine all converged in one-the 'Atman', the 'Brahman'.

While admitting when a body is born it must have its end like the cloths that we wear - oriental philosophy always stressed on 'Keeping the clothes clean as long as they were being used". When discussing Indian philosophy and Ancient Indian Medicine, it is but natural we try to understand the basic teachings of our philosophy and appreciate the acceptance and application of the ancient natural means of curing an ailment.

The four Vedas, the Upanishads, the Geeta and our epics all taught us to live a life to the liking of the creator and in the process while covering almcst all the branches or sciences and philosophy, had very significant reference about "good health" and of course about food and medicine.

One may wonder in this era of modernism and great scientific achievements, what can be the use of such research. In answer it can be humbly stated that, can we really forget out foundation and live in the super-structure only and where is the guarantee that we have learnt all and there is nothing left for us to pick up from the ancients ?

Indian philosophy is vastly different from Greek philosophy and this difference can be explained by the different topographical, environmental and climatic conditions that prevailed in the two countries. Not only did these factors give rise to two vastly different spectrum of diseases but also gave birth to two, vastly different philosophies and hence the attitudes to diseases and ill health in the two countries.

Greece is a small country, where on a clear dry you can see Corinth in the West from the Acropolis in Athens. There Mount Olympus which is just 9800 feet high dominates the country. In fact, Greece in antiquity covered only an area of approximately 25,000 square miles, though our imagination tends to magnify the land that has given the world such valuable gifts in every branch of culture.

The Indian subcontinent on the other hand was a very vast country extending from the indomitable Himalayas

to Ceylon and from Baluchistan to Burma, covering an area of approximately 1 million square miles.

The Greeks naturally developed a nation that they could dominate the landscape but here in India man felt very small and inadequate. The Greeks believed they could conquer and master nature by ingenuity and force but Indians realised that nature could only be conquered by the spirit or consciousness. Thus, we find Alexander setting out to conquer the world, while Indians were largely a closed,self contained people, who never felt the urge to subjugate her neighbours and only once did the people of India go abroad and this too was on a spiritual mission—to spread the teaching of Buddha to the far East.

The season in the Indian Subcontinant are very ulike those in Europe. After the dry, dusty, torrid summer comes the rains which are after torrential and continuous unlike anything seen in Europe. So the weather never encouraged vigorous outdoor activities in contrast to the temperate European climate which promoted vigorous physical activities. So the Indians tended to be in introspective and contemplative rather than being outgoing.

Though Greek philosophy began with speculation about nature and origin of the world, their theories were based on day to observations. Transcendental thinking was not generally resorted to though in no way were they irreligious. In fact they were searching for the harmony that they realised was present in the cosmos but lacking in human life. This was the Ionian form of religious experience.

In India however, mystic thinking, transcendental meditation etc. occupied a large part of day to day life. And on top was the all pervading influence of the Vedas, which stood like grand monuments, and to which Indians could fall back for any kind of support.

Vedas mean knowledge, and Vedas were the source of all knowledge including ancient medicine. Not only did the Vedas teach how to live in peace with the gods, how to be safe among the hostile forces of nature but it also taught us about restoring and maintaining health especially the Atharva Veda. This important as it gave birth to both therapeutic and preventive medicine.

Based as they were on the Vedas—all the major philosophical systems accepted Brahmanism—the Brahman, which is the source of all forces in nature That whose part was the Atman man's individual spirit. We will see how this deep rooted faith in Brahman and Atman shaped the development of ancient medicine. one question that does arise here is, wasn't this over-dependence on something ao mystic as the Brahman, more of a deterrant factor in the progress of medicine ?

I will try to answer that in my discourse. Another important aspect of Indian philosophy was the belief in reincarnation and its close relation to Karma. Essentially man's happiness and sorrow, his status in the present and future life are all determined by his Karma. The sum total of the good and evil done, detemines whether the person will be born at a higher or lower station, where a new chance is provided to improve his Karma. The goal of this

philosophy was to inculcate discipline and moral integrity and eliminate the base urges and craving for superficial sense pleasures.

Though this philosophy had very practical consequences so far as leading a healthy physical and spiritual life was concerned, it had its negative side so far as practical medicine was concerned and there can be no debating the fact that a very substantial part of medicine is physical.

The dissection of the dead body for better anatomical understanding was looked down upon and even considered sinful. Animals were considered no different from human beings and could not be killed. The material body was relegated to such a non-significant level and Atman given such pride of place that physical medicine failed to develop significantly—at least in the earlier stages. Also this attitude explains the lack of historical senses which is so outspoken in India. There is nothing similar to the chronicles or annals that the Chinese wrote. There is not Indian Thucydides, Tacitus or sze Ma-chein. Why write history when the past is still alive ? Fact and fiction are so blended in Indian historiography that chronological documentation is often very difficult.

However, these drawbacks were very nominal compared to the advantages those beliefs bestowed.

Medicine was not applied mechanically but was spiritualised to conform to the Indian mind. This combination of spiritual and practical medicine is indeed unique and calls for some deep introspection on our part we the practical physicians, especially as we approach the 21st

century with so much dependance on technology. Even with the transcendental background practical medicine did flourish—as is evident from the deeds of Charaka, Susruta and others.

The two had been and still are complementary to each other and there is no reason for one to be a deterrant force in the progress of medicine.

Different philosipical system had profound influence on medicine. I will discuss the Samkhya philosophy, the Vedanta, the Lokayata and Buddhism, and their influence in the practise of medicine.

The Samkhya Philosophy and Medicine

This decidedly pre-Buddhist philosophy was strictly dualistic with the eternal soul on one hand and the material world which evolved from the primordial element into which it will ultimately dissolve on the other. It also acknowladged Karma and reincaraction.

The aim of his philosophy was to identify the antagonism between soul and matter and how to divorce the soul from the material body.

This gave us the philosophy of Yoga and the c work of 'Yoga-sutra' by Patanjali—whose exact date in however controversial.

Yet there is no doubt that Yoga techniques are old. We find them in the early Upanishads and some elements can be traced back to the Atharva-Veda. Seals from Mohenjodaro also revealed a god in the characteristic position of Yogi.

Yoga liberates the mind—the true self—from the clutches of material body and practising Yoga stills the

agitated mind. The implications of an agitation free mind are enormous with regards to health and disease.

The mind has far reaching control over our body and once the mind is properly trained illness and disease can be conquered. Every cell in our organism is controlled by the central nervous system which conveys impulses of the mind. Every physician knows—that the mere will of a patient, his determination to get well is a very strong and decisive healing factor. So we can well imagine the power or a mind concentrated in meditation and its immense curing potentialities.

Also it is documented how this process of psycho-somatic dissociation which ultimately leads to total renunciation and a state of total ecstasy can even confer on the subject the power of occult healing.

This ecstatic condition—the mystic communion with the divine is mentioned in all religions but nowhere was the technique of Yoga meditation developed and practised to such a high degree of perfection as in India.

Vedanta

Vedanta on the other hand with its monistic philosophy of Brahman and deep rooted belief in Karma and re incaration could not influence medicine so strongly. It was wa l-accepted and even enjoyed popularity far and beyond because of its simplicity, rationalism and tolerance. But the concept of what we perceive with our senses is Maya, for there is but one reality—the Brahman, which is beyond all sense perception was too mystic a philosophy to influence such a 'sense oriented' subject

as medicine. It called for a highly disciplined, escetic and regulated life.

The Lokayata

It must be stated that all the idealistic philosophies did not remain unopposed and quite naturally. There was the purely materialistic school of the Lokayata meaning "belonging to the senses" and its main proponent was Charvaka.

It denounced Karma and reincarnation as fraud and promulgated the theory of "perception only as the means of knowledge" and this perception had to be acquired through our senses. Spirit, soul, Brahman were eyewashes and were invented to enhance and enrich the priestly classes.

Such a radical philosophy was obviously termed heretic and was vehemently opposed. However, this school had a following and developed a system of health care similar to the Milesian school in Greece, which today would not appear as very irrational. In fact they were the ones who advised the use of styptics and astrigents for wounds and injuries, they championed the use of herbs and alkaloids for treatment of rogas. To them this constituted proper medical treatment and they side-lined and neglected the 'mind' aspect related to any disease. But the whole idea was so diametrically opposite to the traditional thinking that it did not survive for long, just as the Makkali Gosala School a contemporary of Buddha who believed it is not our action that determines our fate but circumstances and the environment.

Buddhism

The philosophy that did achieve a critical analysis of old age, disease, suffering and freedom from it, was no doubt Buddhism. It approeched the problem of health and disease with the precision of a surgeon and Goutam Buddha's teachings of an universal philosophy had very close affinities to medicine and influenced it greatly.

Buddha's Four nobel truths corresponced exactly to a physician's approach to a patient and he coul'd be called the spiritual doctor of mankind. He found out that the life was intrinsically sorrowful—just as the physician knows how much suffering and pain a disease causes to the patient.

The physician next comes to a diagnosis, ascertaining the cause and nature of the disease, so does the Buddha in his second truth where he pinpointed the cause and origin of all human suffering—which is "craving for sense pleasures".

The physician next prognosticates on the outcome of the disease. Buddhism too comes to the conclusion that suffering mankind can be alleviated, if the proper pathway is choosen which according to Buddha is the Noble Eight fold path. This when related to medicine becomes the treatment of the patient. Noweere in the different Indian Philosophies can such a remarkable analogy be found between the philosophy of life and medicine.

In conclusion, I may state archaic medicine was, though to a large extent, a combination of religions, magical and empirical practises, it was not totally devoid of a scientific approach to health and disease. And in ancient India we find the approach to life, the process of thought development, the priorities on values were all guided by some philosophical school or other with the Vedic principal as the fountain head all the different streams. Medical science which is but a natural offshoot of the way in which our thought process evolves deperded and developed on and along these philosophical lines.